DIETS AND RECIPES

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AND THE TREATMENT OF DIABETES AND OBESITY

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OXFORD UNIVERSITY PRESS

LONDON : HUMPHREY MILFORD

1937

OXFORD UNIVERSITY PRESS
AMEN HOUSE, LONDON, E.C.4
Edinburgh Glasgow Bombay
Calcutta Madras Melbourne
New York Toronto Capetown
HUMPHREY MILFORD
PUBLISHER TO THE
UNIVERSITY

PRINTED IN GREAT BRITAIN BY HEADLEY BROTHERS
109 KINGSWAY, LONDON, W.C.2; AND ASHFORD, KENT

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APPENDIX

Pages 65-105 of the Appendix, containing Diet Tables, Recipes and four Specimen Diets, are also published separately for daily use in the home

LIST OF ILLUSTRATIONS

PREFACE

THE diet tables and recipes in this book were originally constructed for use in diabetes. The method of calculation and some of the tables and recipes were published in a preliminary form in 1931.[1] Their *raison d'être* is that, since in the latest treatment of diabetes the diet contains more carbohydrate and less fat approximating to the normal diet of the general population, diabetic patients can now eat ordinary food, provided they know what they are eating and do not eat too much. The author has used the original tables since 1930 and as they have been appreciated by his patients and have recently to some extent come into use at Guy's Hospital, their publication in an extended form was decided upon. But though diet in diabetes is the first aim of this book it soon became clear that the tables and recipes had a wider scope and with certain additions they could be used, if suitable explanations were given in any condition where variety in choice is to be combined with a diet of definite Calorie value. Since the diet tables and recipes were to be the main feature of the book, any exhaustive treatise on diet was out of the question. Consequently it was decided to deal almost entirely with the treatment of the two diseases most commonly met with, where diet tables are important —diabetes and obesity—although reference will also be made to other conditions such as renal insufficiency, high blood pressure, gout and oxaluria. The book contains 211 recipes and 21 specimen diets. No reference has been made to the cost of food-stuffs, since this has been dealt with by V. H. and E. C. Mottram.[2]

In a new study of heat production in man Mr. T. W. Adams and the author[3] have lately worked out afresh the relation between body weight and basal requirement as regards food. Consequently, this book and tables may perhaps be found useful to those in charge of institutions who have the feeding of large numbers of individuals under their care.

The analyses of Atwater and Bryant have formed the main foundation for the present tables; but in certain aspects they fall short. Thus, the more recent analyses of McCance and Lawrence[4] (1929) and of Widdowson and McCance[5] (1935) have been used for nuts, cooked vegetables and fruit and the analyses of McCance and Shipp[6] for cooked flesh foods (1933). For certain English foods Plimmer's figures[7] have been used and a few values have been

obtained from H. Schall's *Nahrungsmitteltabelle.*[8] Dr. W. W. Payne has very kindly made a few supplementary analyses. Hutchison and Mottram's *Food and the Principles of Dietetics*[9] has been consulted for certain alcoholic beverages. Analyses of proprietary foods have been obtained from the makers. Tables 1 to 8 in the appendix, and all the recipes, with specimen diets A to D, are published separately by the Oxford University Press so that they may be ordered separately and retained by patients for use at home.

I should like to thank Mrs. Hawkey for her able co-operation in this part of the work, and Dr. Otto May for supplying the figures in Table B., and Dr. W. W. Payne for a number of suggestions. Analyses by McCance, Widdowson and Shackleton,[10] published just before sending the book to press, have been incorporated. I should like to pay a tribute to the value of this analytical work, which is being carried out at King's College Hospital, under the ægis of the Medical Research Council.

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May 1936.

[1] Discussion on the use of high carbohydrate diets in the treatment of diabetes. *Proc. Roy. Soc. Med.*, 24, 1291.

[2] V. H. and E. C. Mottram, *Sound Catering for Hard Times*, London, 1932.

[3] *Guy's Hosp. Reps.*, 85, 447, 1935.

[4] The carbohydrate content of foods, Med. Res. Council, 1929. Spec. Rep. Ser. No. 135.

[5] *Bioch. J.*, 29, 151.

[6] The chemistry of flesh foods and their losses on cooking, Med. Res. Council, 1929. Spec. Rep. Ser. No. 187.

[7] R. H. A. Plimmer, *Analyses and Energy Values of Foods*, London, 1921.

[8] Leipzig, 1929.

[9] London, 1933.

[10] The Nutritive Value of Fruits, Vegetables and Nuts, Med. Res. Council, 1936. Spec. Rep. Ser. No. 213

Chapter I

DIET AND DIABETES

Introduction.

The three kinds of food-stuffs in a diet are: (1) The *Carbohydrates*—starches and sugars—met with chiefly in the vegetable kingdom; (2) The *Fats*—chiefly of animal origin—meat fat, butter, cream, cod liver oil, etc.; the vegetable fats include olive oil and the fat in nuts; (3) The *Proteins*—nitrogenous substances, necessary constituents of all animal and plant cells, eaten for the most part in our civilization as milk and eggs and as meat;—the latter comprises the muscles of all animals and organs such as liver, kidney and tripe. These are known as *first class* proteins, as distinct from the proteins in bread, cereals, vegetables and nuts, which are known as *second class* proteins and are not so valuable. Then there are accessory food substances or *vitamins* which are required in quite small amounts for normal growth and health; to insure a sufficiency of these the diet should contain some milk, butter, eggs, fresh fruit or fruit juice, salads and vegetables. The body also requires enough inorganic salts to balance those that are lost daily in the urine, fæces and sweat; but a good ordinary "mixed diet" with the addition of some salt will afford a sufficient supply. Milk, the complete food of the infant, contains all of the foregoing substances; but there is little iron, an extra supply of which is not required during the first few months of life.

The adult can do with a very small amount of protein in his diet, not much more than is enough to replace what is lost in the wear and tear of the body tissues, which amounts to between 10 and 20 grm. a day. Rather more protein is required for children to allow for growth; but probably both for adults and children a considerably higher ration of first class protein is beneficial in promoting health and growth. The ordinary diet contains up to 100 grm. a day and the extra protein is partly burnt appearing as carbon dioxide in the breath and partly excreted by the kidneys in the urine in the form of nitrogen, sulphur and phosphorus containing substances. However, a great variation in diet is possible, ranging from the very high protein diets of the Esquimaux to the low protein diets of the rice eating natives of India and China. The diet of the strict vegetarian usually contains eggs and milk,

and so has plenty of protein. By far the largest amount of the food eaten is used as fuel in the body to supply energy by which we live and move and have our being, and the carbohydrates and fats, if not eaten to excess, are entirely used for this purpose.

How Much Food to Eat.

The healthy subject may well claim to eat when he likes and what food he likes and, provided he pays regard to his appetite, refusing to eat when he does not feel inclined to and stopping as soon as he is satisfied, he may well preserve his youthful figure up to a good old age. But clinical experience is on the whole against the view that all obese people have merely abused their appetites; but they have *all* reached their tragic position, because they took more food than their bodies could tolerate and, as the cure of obesity is so much more trying than its prevention, they may well distrust their appetite and pay attention to Calorie values as soon as they notice that they are beginning to put on weight.

Diets are based on the natural or "predicted" weight of the individual, which is not necessarily the same as his actual weight, because he may be too fat or too thin. The predicted weight is obtained from the height or stem length (sitting height), always remembering that there is a wide range for normal subjects and it is only when the weight lies at or beyond the limits of the range, that a diet calculated from the predicted weight should be used, so as to enable the patient to lose or gain weight. Otherwise, his actual weight is used in the calculation.

Between the ages of 5 and 15 years or more exactly as the average boy or girl grows between a height of 42 and 60 inches, there is a simple relation between the body weight and height,[1] so that when the height is known the average weight can be determined as well as the range within which about 90 per cent of observations on normal subjects fall. For example, if the height is 50 inches, from the bottom of Fig. 1 at this point a line is drawn vertically upwards to cut the middle of the three lines at 54 lb.; this is the average weight while the range within which 90 per cent of normal observations lie is from 63 lb. (given by travelling upwards to the line above) to 47 lb. (on the line below). These lines may be used both for boys and girls.

The basal requirement of the child may be looked on approximately as the amount of food that would be required if he remained at rest in bed through the 24 hours. Suppose a boy of 50 inches weighed 80 lb., he would be too fat, a basal requirement corresponding to the maximum normal 63 lb.—might be chosen or a lower

figure supposing a reducing diet was prescribed. 63 lb. corresponds to an average Calorie value of 1,050 obtained by travelling horizontally to the middle of the 3 Calorie lines on the right of the figure; the normal range, viz. 1,200 to 920 is obtained by travelling horizontally from this point to the right- and left-hand Calorie lines.

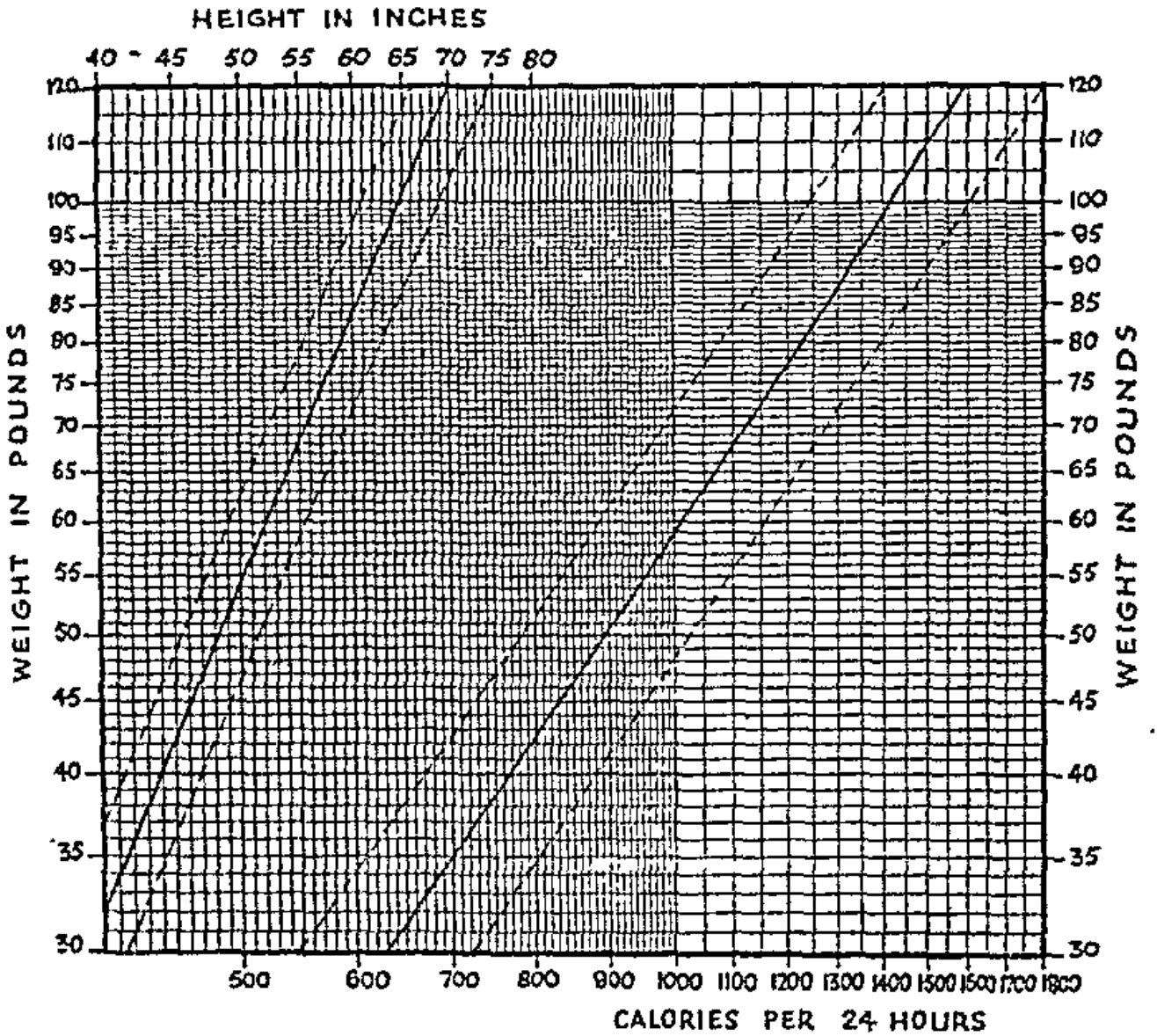


FIG. 1.

Left-hand side.—The continuous line is used for determining the average weight of children, from their height.

Right hand side.—The continuous line is used for determining the average basal metabolism of boys from their weight. (See text.)

These 3 Calorie lines refer to boys; the basal metabolism of girls over 5 is lower; the left-hand line gives the approximate *average* value for girls. The basal value must be increased by 25, 50 or even 100 per cent to allow for the exercise usually taken.

For children above 5 feet high or 15 years old, and for adults up to 25 years, Ainley Walker's figures[2] in Table A relating weight and stem length are recommended and these may also be used for younger children.

To get the stem length the patient sits upright on the floor with his back against the wall (not on a chair, unless he is an invalid). In taking up his position he should at first bend a little forward so as to be able to press the bottom of his back well into the corner against the wall with his legs a little bent in front of him at the knee. The measurement is taken from the floor to the top of his head. The mean weight corresponding to this stem length is taken as the predicted weight; but if his legs are unusually long a value

TABLE A

RELATION BETWEEN BODY LENGTH AND BODY WEIGHT IN NORMAL SUBJECTS

Body Length.	Body Weight (lb.).					
	Male.			Female.		
Inches.	Max.	Average.	Min.	Max	Average.	Min.
20	31	25	21	31	25	21
22	41	34	27	41	34	27
24	54	44	36	55	45	37
26	68	56	46	69	57	47
28	86	70	57	88	72	59
30	105	86	70	109	90	74
31	117	94	78	121	98	82
32	128	104	85	133	109	90
33	141	114	94	146	119	99
34	154	125	103	160	131	109
35	169	136	112	175	142	118
36	183	148	122	190	155	129
37	200	161	134	208	169	142
38	217	174	144	226	183	153

Max. and Min. represent the range of variation for approximately 90 per cent of normal people.

nearer the maximum of the range must be looked on as the predicted weight, and if his legs are short a value nearer the bottom of the range should be taken.

Above 25, i.e. for older subjects than those studied by Ainley Walker, there is a difficulty. There does not seem to be any physiological reason why a full grown individual should increase in weight as he grows older by putting on fat and there are many people who do maintain their original adult weight unaltered throughout life. Yet Life Insurance statistics show that there is on the average a steady increase in weight up to 50. Is that increase to be regarded as a fault of civilization—keeping up the food intake and lessening

the exercise? For those who believe in the strenuous life Table A is available up to any age; for those who would allow some latitude the Life Insurance figures above 25 (Table B) are also given, always remembering that these should be regarded as an upper limit and the weight should preferably be kept at a lower level by some 5 or 10 lb. as recommended by Rabinowitch for diabetes; this will increase the expectation of life of the ordinary person. All the weights and heights in Table B include ordinary indoor clothing with boots or shoes; all other figures and tables refer to the naked subject.

TABLE B

RELATION OF HEIGHT AND WEIGHT AT DIFFERENT AGES

Height in inches.	Ages 25—29.		Ages 30—34		Ages 35—39.		Ages 40—44.		Ages 45—49.		Ages 50 and upwards.	
	M.	W.	M.	W.	M.	W.	M	W	M.	W.	M.	W.
58	—	114	—	117	—	120	—	124	—	127	—	129
59	—	116	—	119	—	122	—	126	—	129	—	131
60	124	118	127	121	129	124	132	128	134	131	135	133
61	126	120	129	123	131	126	134	130	136	133	137	135
62	128	122	131	125	133	129	136	133	138	136	139	138
63	131	125	134	128	136	132	139	136	141	139	142	141
64	134	129	137	132	140	136	142	139	144	142	145	144
65	138	132	141	136	144	140	146	143	148	146	149	148
66	142	136	145	140	148	144	150	147	152	151	153	152
67	146	140	149	144	152	148	154	151	156	155	157	157
68	150	144	154	148	157	152	159	155	161	159	162	162
69	154	148	158	152	162	156	164	159	166	163	167	166
70	158	152	163	155	167	159	169	162	171	166	172	170
71	163	155	168	158	172	162	175	166	177	170	178	174
72	169	159	174	162	178	165	181	169	183	173	184	177
73	175	—	180	—	184	—	187	—	190	—	191	—
74	181	—	186	—	191	—	194	—	197	—	198	—
75	187	—	192	—	197	—	201	—	204	—	205	—
76	192	—	198	—	203	—	208	—	211	—	212	—

Height in inches. Weight in lb. clothed. See also text.

If the subject has become too fat or too thin, his previous weight if known will also act as a guide to his predicted weight; but if the wasting is due to diabetes it must be remembered that the latter commonly follows on obesity.

The Calorie value of the basal diet over 15 years is obtained from the nomogram in Fig. 2 by noting where a ruler placed across it over the subject's age, according to sex, and his weight or predicted weight (naked) cuts the intermediate line of Calories per 24 hours. This value represents the heat output of the individual through the 24 hours if the subject is at rest and taking no food. An addition of 10, 25, 50 per cent or more must be made if he is up and about, the actual increase depending on the amount of muscular exercise that he is taking.

The results may be arrived at in another way. 2,400 Calories is regarded by the League of Nations Commission as the daily requirement for a man leading an everyday life, and 25 Calories per hour must be added for light work, 50 Calories for moderate work, 100 Calories for heavy work and 200 Calories or more for very heavy work. Rather lower figures for the output of heat have been calculated by the author from certain published figures; but two facts must be borne in mind, the output of heat for an occupation increases with the weight of the subject and men whose occupation is laborious probably take an easier time on Sunday and at other times when they are not working, and the average intake of food must make allowance for these quiet periods. Some instances may be given. At a printing works[3] where the work in the compositor's room, machine room or foundry, though mild in degree, required sustained effort; the daily requirement was calculated as follows:—

TABLE C

	Age	Weight lb.	Calories per 24 hours	Basal Calories.	Excess total over basal Calories.
					%
Woman, L.B.	25	97	2,000	1,180	70
Woman, E.R.K.	28	114	2,100	1,300	62
Man, Average	48	150	2,400	1,520	58
Man, G.S.	51	218	3,200	1,940	65

A builder's labourer[4] weighing 176 lb. would require 3,200 Calories. Professor Neville Moss's[5] results for the average miner are higher. The present author calculates that for a man weighing 143 lb. 4,000 Calories a day would be required if he worked

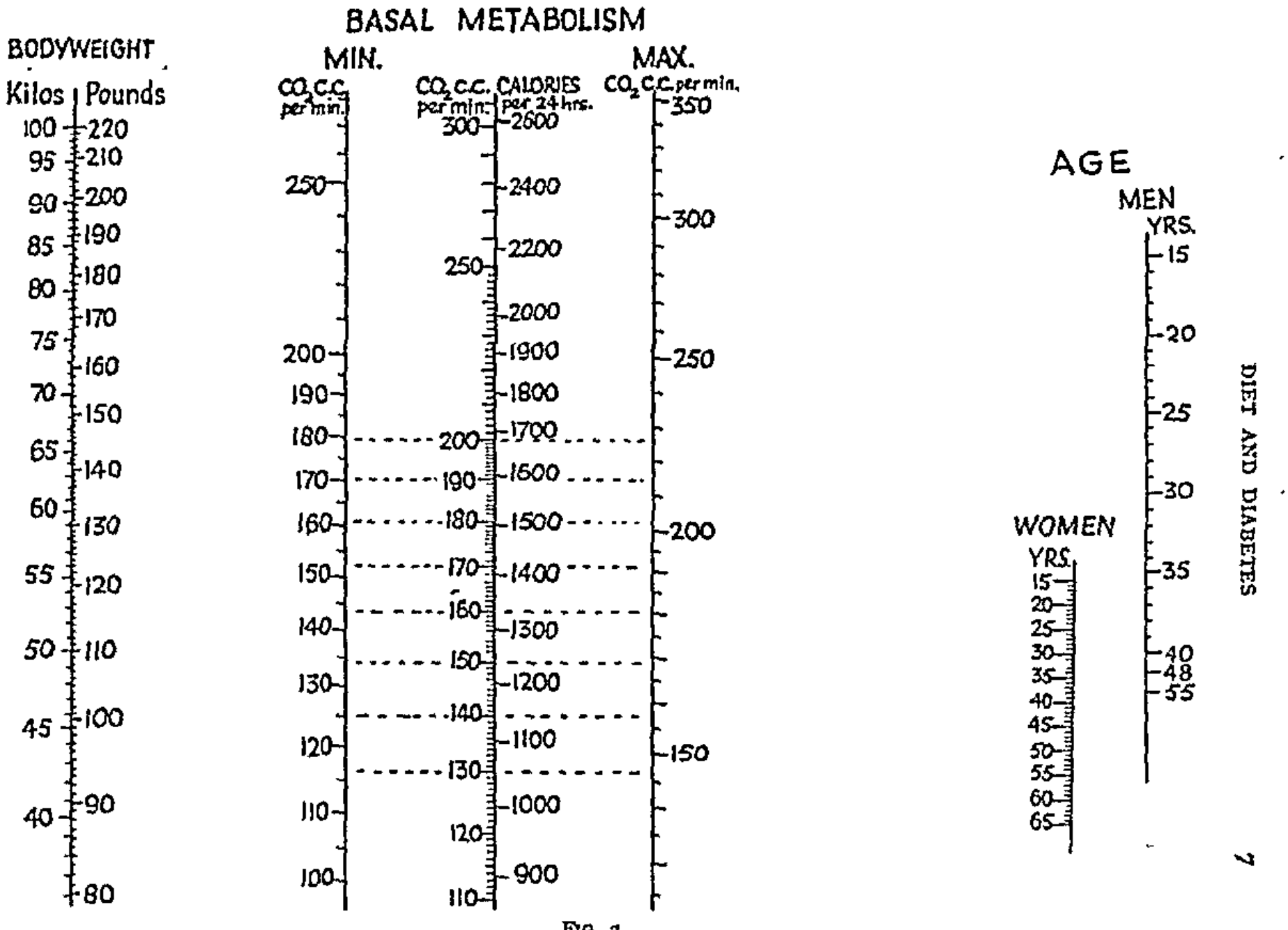

BASAL METABOLISM
BODYWEIGHT
Kilos
Pounds
100 220
95 210
90 200
85 190
80 180
75 170
70 160
65 150
60 140
55 130
50 120
45 110
40 100
90
80
MIN.
MAX.
CO2 c.c. per min.
CO2 c.c. per min.
CALORIES per 24 hrs.
CO2 c.c. per min.
300 2600
250
2400
2200
250
2000
200
1900
190
1800
180
200
1700
170
190
1600
160
180
1500
150
170
1400
160
140
1300
150
130
1200
140
120
1100
130
110
1000
120
100
900
110
300
250
200
150
AGE
MEN
YRS.
15
20
25
30
35
40
48
55
WOMEN
YRS.
15
20
25
30
35
40
45
50
55
60
65

FIG. 2.

5½ shifts a week and 3,300 if he worked for only 3 shifts. For the public school boy taking plenty of exercise it has been found that the food taken amounts to 3,500 Calories daily.

These results will indicate roughly the food required in different occupations; but it must be admitted that the diabetic patient usually does well on a diet with a Calorie value rather lower than these figures suggest; the author rarely prescribes more than 2,400 Calories. In any case the patient's body weight, which should be taken at regular intervals, is the guide; if too much food is given the weight will increase unduly and *vice versa*.

Diet Tables.

Analyses of foods are expressed in percentages, and in this country the first way of using such information was to calculate the carbohydrate protein and fat content and the Calorie value in 1 oz. of food-stuff and by adding successive ounces together a dietary could be formed containing the required amount of carbohydrate and protein and with some addition of fat, after a certain amount of juggling with figures, the necessary Calorie value was obtained.

As far as carbohydrate is concerned the first improvement was introduced by O. Leyton in his 5 grm. ration scheme for carbohydrate in which the weight of foods containing 5 grm. of carbohydrate was calculated. A definite amount of carbohydrate expressed as so many 5 grm. rations could be taken at a meal by weighing out the amount of food corresponding to these rations, and since the 5 grm. rations were interchangeable a wide variety of diet was possible. The success of the scheme depended on the fact that simple foods like bread, potatoes, vegetables, cereals contain mainly carbohydrate without much protein and very little fat. Lawrence[6] elaborated the scheme; he called Leyton's 5 grm. rations carbohydrate "lines" which are printed in black (recently increased to 10 grm.) and in addition there are red "lines" which contain 7½ grm. protein and 15 grm. of fat. A diet of given carbohydrate protein and Calorie value is made up by ordering so many red and black lines. Rabinowitch's equivalents[7] are arranged on a similar basis.

The Author's Scheme. The germ of the author's scheme of dieting as it applies to diabetes is contained in Sansum's book[8] which was written to advocate higher carbohydrate diets, and which contained a number of diets of varying Calorie value each calculated to contain carbohydrate and fat in the proportion of two to one. It was a simple matter to extend the principle to diets

containing other ratios of carbohydrate and fat and to make them available for physicians generally whether they preferred to use a smaller or a larger proportion of carbohydrate.

Prescribing a Diet.

Apart from regulating the amount of carbohydrate for a patient with diabetes the most important requirement of dieting is to keep the total Calorie value within reasonable limits so as to prevent the body weight from becoming too much. An allowance of ½ grm. of protein per lb. of body weight is very commonly made in uncomplicated cases; but there does not seem to be any reason for making a hard and fast rule, and there would be no objection to giving up to 100 or even 110 grm., the maximum consumed by ordinary people. Hence diet tables should be arranged so as to allow both the amount of carbohydrate and the total Calorie value to be rapidly determined; except in certain diseases the exact amount of protein may be regarded as of secondary importance. A 20 grm. ration of carbohydrate has been advocated to form a reasonable helping of a given food, such as bread, at a meal. A 10 grm. fat ration has been chosen for the same reason. In Table 1 (Appendix, page 67) there are eight series of standard diet formulas calculated according as the ratio of carbohydrate to fat varies from 1 to 2 to 6 to 1. The Calorie value increases on descending the series and opposite each Calorie value there are one or more formulas, which indicate the number of 20 grm. carbohydrate rations (CR) and the number of 10 grm. fat rations (FR) and the amount of protein in grams (P) required to make up the value. Intermediate values are obtained by adding the top line which represents 200 Calories; this will involve making a subtraction from the protein figures in Series 1 and 5 as indicated by the minus sign.

Tables 2 and 4 contain a list of the common foods with some proprietary articles and the weights of these foods which contain 20 grm. carbohydrate and 10 grm. fat respectively, while the last column gives the weight of protein that each of these carbohydrate and fat rations contains. Fruit and vegetables, which are bulky carbohydrate containing foods, are arranged in half rations (Table 3) and the same applies to the foods which contain only a small amount of fat (Table 5). There remain a few foods which are mainly protein in composition, arranged in Table 6 and those foods which contain all three food-stuffs—carbohydrate, fat and protein—of which milk is the most striking example; these are arranged in Table 7. A list of substances of little or no Calorie value is given in Table 8. There is at the end of the appendix a list of beverages in Table 9 and

Table 10 is added to help patients to calculate the contents of their diet, if they wish to change over to the author's scheme. Unless special note is made the food in all the tables is weighed or measured ready for eating. In many cases in front of the named article the weight of the article, as bought, has been added for convenience in shopping; but the weight of the prepared or cooked food should always be taken in making out a dish.

In this book carbohydrate is calculated as starch and not as dextrose and a word of explanation on this point is desirable. The formula of glucose is $C_6H_{12}O_6$ and of starch $C_6H_{10}O_5$. Now in nutrition these molecules are equivalent to one another and interchangeable; for instance, the glucose of the food is stored as glycogen or animal starch. Hence the amount of glucose and starch in the food should not be simply added together; they must be reduced to the same terms first of all, and starch is the most appropriate choice, because the Calorie value of 1 grm. of starch is 4·1 and this figure is universally used in calculations, while the Calorie value of 1 grm. of glucose is 3·65, quite a different figure. This rule has not been acted on in the past. If starch values are used for carbohydrate then 21 grm. of cane sugar and 22·2 grm. glucose will be the equivalent of 20 grm. carbohydrate. No account is taken of the glycerol fraction of the fat, which should really be counted as carbohydrate; but this can readily be done by subtracting 10 per cent from the fat and adding this to the carbohydrate; in special research work this may be desirable, but in ordinary circumstances it is unnecessary since the patient will only require to take daily a fixed proportion of carbohydrate and fat.

In most diet tables only simple foods are included; but there is no reason why diabetic patients should not eat foods that anyone else eats, provided the composition is known and the total quantities are not transgressed. This is now possible and the thanks of the author are due to Mrs. Hawkey for the great trouble she has taken in preparing over 200 dishes, the composition of which has been adjusted to fit into the scheme of carbohydrate and fat rations just described. In the appendix the formulas of these recipes and the recipes themselves are arranged in the usual order of a cookery book. A wide choice is open to the patient; by taking his carbohydrate and fat rations in the form of ordinary suet pudding, fruit pies, pancakes or even as cake, if sugar is allowed, the diabetic patient need no longer regard himself as separated from the rest of the family when meal times come round. The calculations will be easier if all foods, except liquids, are measured in grams. In many of the recipes the dishes have been made large enough for

two or more persons, so that they can be divided at table without weighing. The weight of each portion is also given in case larger puddings are made; allowance has, of course, been made for loss of weight in cooking.

In order to demonstrate the use of the tables a number of diets—A to U—are given at the end, between 2,200 and 800 Calories with a carbohydrate to fat ratio varying between 2 to 1 and 6 to 1. For instance, suppose it is desired to make up a diet of 2,200 Calories containing a carbohydrate to fat ratio of 2 to 1; such a combination will be given by adding the corresponding formula in the top line of Table 1, viz. 1 CR, 1 FR, 6 P to any of the four formulas for 2,000 Calories. Thus the formula 10½ CR, 10½ FR, 88 P has been chosen for Diet A. The amount of milk to be drunk through the day is first decided, in this case 7 oz., which is equivalent to ½ CR, ½ FR, 7 P. This does not include the amount used in the recipes for cooking which is allowed for separately. Other fluids such as water, tea, coffee and broth will be taken as required in any quantity. The patient will probably be taking plenty of Class 1 and 2 vegetables, which as indicated on Table 3 need not be weighed, but which will be equivalent to another ½ CR. These foods are entered at the head of the dietary, and on subtracting 1 CR, ½ FR, 7 P from the original formula there will be left 9½ CR, 10 FR, 81 P to be distributed through the day. Most carbohydrate (3½ CR) will be given at breakfast and dinner following insulin, if this is injected twice daily and less at lunch (1½ CR) since this meal is farther removed from the injection; but the carbohydrate at lunch would be increased if the patient were taking a third dose of insulin before this meal. The fat ration will be taken in more or less equal amounts (3 FR) at the three chief meals of the day; these are chosen partly as meat, bacon and eggs, and partly as pure fat such as butter and cream. The protein from the carbohydrate and fat will then be added up to make approximately the desired 88 grm. Tea is an awkward meal, as it is taken farthest of all from the morning insulin and before the evening dose. Patients may be encouraged only to drink tea with the required amount of milk and avoid other food since three meals a day should be sufficient; but practically tea is one of the most appreciated meals for social reasons and so 1 CR, 1 FR has been allowed in the diet; but care must be taken to see that this meal does not cause too great a rise of blood sugar and less carbohydrate may be desirable.

In the diets all alternatives are indented, i.e. printed to the right of the original meal. They are of two kinds: (1) *Part formulas.* In breakfast there are two part formulas—3 CR which is dealt with

first and ½ CR, 3 FR containing bacon, egg, butter and fruit and alternative part formulas which include sausages or fried fish. Two part formulas are given at dinner to allow for meat, chicken or fish in the first part of the meal and a number of puddings in the second part. (2) *Alternative foods.* These are illustrated at breakfast in the various ways of making up 3 CR, i.e. entirely as white bread (the first item) or as white bread in smaller quantity with Oxford marmalade or as white bread with oatmeal. Bread may always be taken as toast; but it is best weighed as bread before being toasted, since as shown in Table 2, the weight of toast varies with the amount of moisture—an uncertain quantity. Meat is weighed lean and cooked and the fat should be weighed separately and counted as such. Exceptionally in the lower Calorie diets quarter rations are employed; but for simplicity these should usually be avoided. It must be noted that the *alternative foods* are always alternative to the single line immediately above. Thus in the first *part formula* 1½ CR, 1½ FR for dinner, the potatoes boiled and butter are alternative to the potatoes mashed in the line immediately above, while the bread sauce in the line above this is taken in both cases, i.e. any alternative food may occupy one or more lines and is indicated by the " or " printed in front of it; the food for which it is substituted only occupies one line. The original meal is read off straight downwards in black lettering. The remaining diets B to S have been made up along these lines and may be copied indefinitely.

How far should sugar be allowed as a sweetening agent? Those who would not allow it in any circumstances are inconsistent if they are willing for their patients to eat jam sweetened with glycerine, because this is converted directly into glucose, or to allow fruit which contains glucose, fructose, and sucrose and milk which contains lactose. The author sees no objection to allowing any of these simple soluble sugars in reasonable quantity at the meal which follows an injection of insulin. But for those who take a stricter view the following plan has been followed. A cross has been placed in front of the listed foods and recipes, when the amount given contains more than 10 or 11 grm. of carbohydrate in the form of a simple soluble sugar, so that these articles can be excluded if considered undesirable. This quantity has been chosen because it is contained in a glass of milk or in 4 oz. of apple, amounts which most physicians would allow to be taken at a meal.

An Alternative to Weighing at Table.

One of the minor difficulties of patients with diabetes is æsthetic but quite natural. They object to weighing food at table and so

drawing the attention of strangers and friends to their disability. It is for this reason that the recipes in this book have been arranged so that a definite fraction can be served to the patient at table. All the weighing will be done by the cook in the kitchen. But this does not apply to certain common articles of diet, such as bread, butter and fruit which will be present on the table. These articles can be cut and weighed before meals; but this implies both forethought and leisure or ample domestic help. Dr. I. M. Rabinowitch[7] of the Montreal General Hospital has devised a method that gets over this difficulty and should be helpful when the patient is taking a meal in a restaurant or hotel. This method is described here, modified so as to apply to the rations recommended in this book. A diagram giving the exact size (area) and thickness of a piece of bread equivalent to ½ CR and 1 CR is shown in Fig. 3. The area which is the same for the half and whole ration is left clear; the thickness which is twice as great for the whole as for the half ration is shaded, the half ration on the left, the whole ration on the right. For Cheddar cheese and butter the size of ½ FR and 1 FR are given in the same way and for roast leg of mutton the ½ FR. A rough oval represents the size of a potato equivalent to 1 CR (Fig. 4), while the thickness is indicated by the shaded area in the centre. The outlines of a banana, an apple and an orange with peel, equivalent in each case to ½ CR, are also shown. Certain articles are measured in spoonfuls; the actual spoons used were chromium plated and bought at Woolworth's. A level spoonful of sugar was obtained by filling the spoon and drawing the straight edge of a card over it. The actual measurements are given in Table D.

TABLE D

SOME MEASUREMENTS OF COMMON FOODS

Ration.	*Food.*	*Shape.*	*Measurement (inches).*
1 CR	White bread	Rectangular figure	3½ × 3½ × ½½
,,	Potato (boiled)	Oval figure	3 × 2½ × 2 approx.
,,	Jam (Hartley's)	Level tablespoonful	
,,	Castor sugar	Level table and teaspoonful together	
½ CR	Banana with peel	Curved figure	5½* × 1½ × 1½
,,	Apple with peel	Circle—diameter	2·55; circumference 8·0
,,	Orange with peel	Circle—diameter	2½; circumference 8·7
½ FR	Butter	Rectangular figure	1 × 1 × ½
,,	Cheddar cheese	Rectangular figure	1 × 1 × 1½
,,	Roast leg of mutton, lean	Rectangular figure	2½ × 1½ × ½

* Linear projection measured.

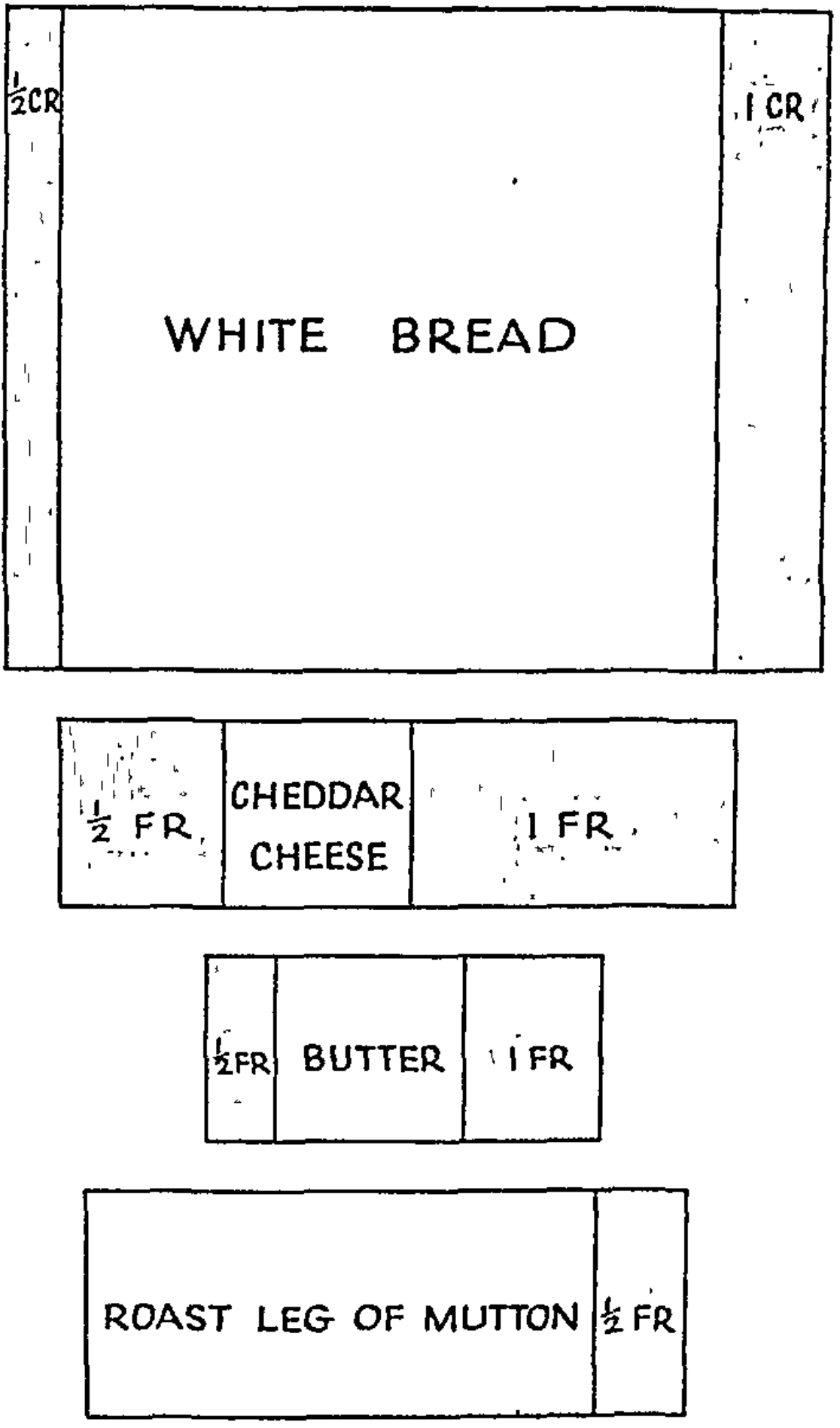
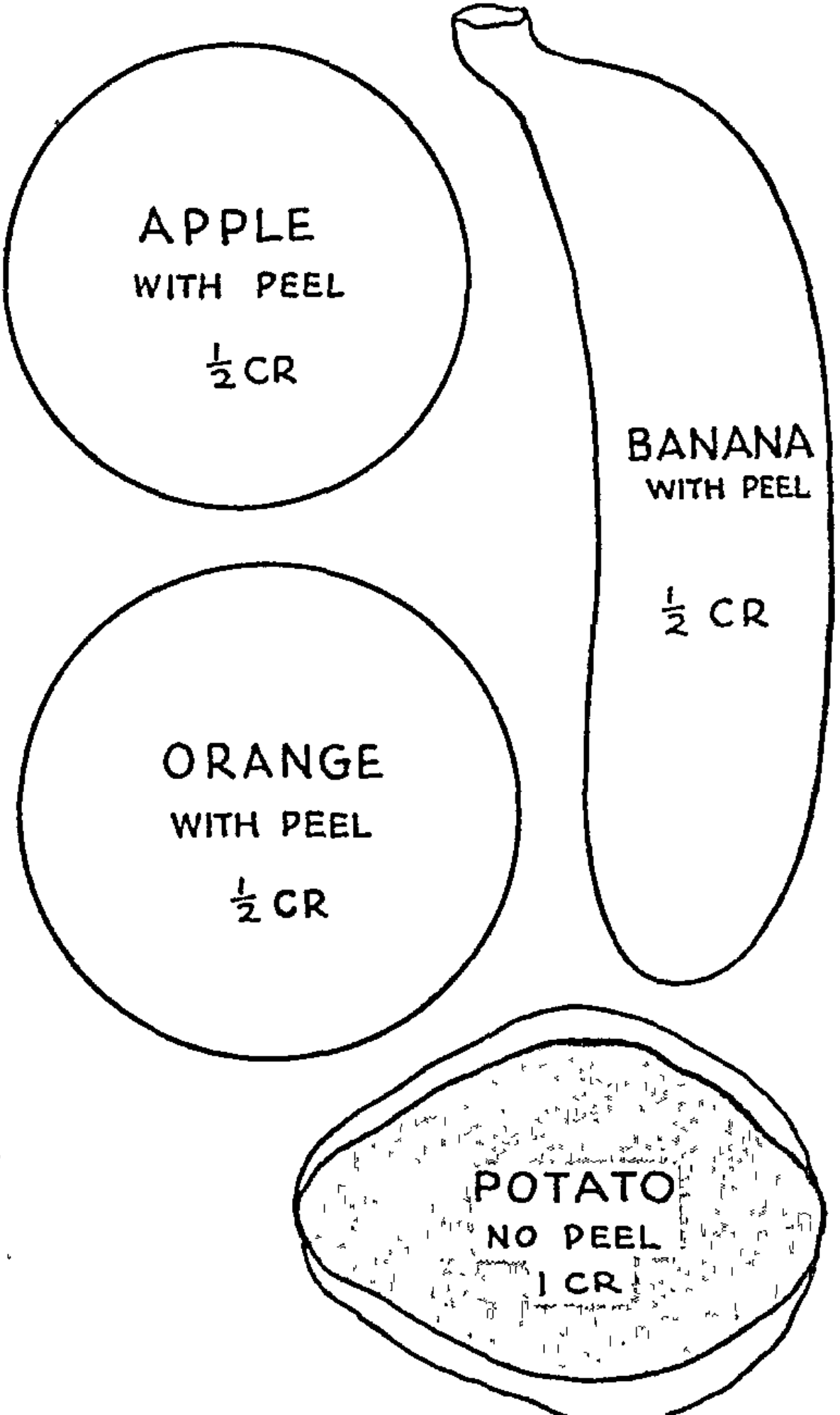

½CR
WHITE BREAD
1 CR
½ FR
CHEDDAR CHEESE
1 FR
½FR
BUTTER
1 FR
ROAST LEG OF MUTTON
½ FR

Fig. 3.


APPLE
WITH PEEL
½ CR
BANANA
WITH PEEL
½ CR
ORANGE
WITH PEEL
½ CR
POTATO
NO PEEL
1 CR

The number of biscuits to a ration is given in the tables, so these need not be measured. Some foods will be used by some patients more than others, as tastes vary. It will be a simple matter to measure out in spoonfuls or into a glass measure a weighed CR of oatmeal, flour, rice, etc. For a patient who will have to live indefinitely with this disease a certain amount of trouble in the preliminary stages will be worth while in order to insure a wide variety in the diet. Dr. Rabinowitch uses wooden blocks of the required dimensions for bread, butter and meat and cardboard figures for the remainder; but it would seem adequate and perhaps simpler to represent all the articles in cardboard or stiff paper; the articles in Fig. 3, after being cut out, are folded at right angles along the lines so as to represent the area and thickness of the ration or half ration.*

* Sets of these can be obtained from Down Bros., St. Thomas's Street, S.E.1.

[1] T. W. Adams and E. P. Poulton, not yet published. These must be regarded as provisional figures

[2] *Proc. Roy. Soc.* B. 89, 157. See also *Guy's Hosp. Gaz.*, 81, 50, 1917.

[3] A. D. Waller and G. de Decker, *J. Physiol.*, 53, P. 104, 1920.

[4] Idem, *Proc. Roy Soc.*, B 91, 166, 1920.

[5] *Trans. Inst. Min. E.*, 89, 132, 1935

[6] R. D. Lawrence, *The Diabetic Life*, London, 1934

[7] J. M. Rabinowitch, *Diabetes Mellitus*, Toronto, 1933.

[8] W. D. Sansum, P. A. Gray, R. Bowden, *The Treatment of Diabetes with Higher Carbohydrate Diets*, London, 1930

Chapter II

THE GENERAL TREATMENT OF DIABETES

Insulin.

Insulin in most cases is given at some time before breakfast and supper, at which meals most of the carbohydrate is taken. The dose of insulin and the interval between the injection and the meal are so arranged as to prevent the blood sugar from rising too high just after the meal or dropping too low some hours later. The effect of the meal is to raise the blood sugar to a maximum an hour or so later; insulin neutralizes this rise.

The action of the insulin, as shown by the blood sugar level, often continues for the full twelve hours after the dose—up to the time when the next dose is due to be given. When the disease is more advanced the blood sugar may rise before the twelve hours are up. The dose cannot be further increased without producing too great a fall of blood sugar after the meal and a "reaction" would be the result. The remedy will be to give a third dose of insulin before the mid-day meal and in this case it will often be advisable to postpone the evening injection until after supper time, so as to divide the twenty-four hours up into two intervals of approximately nine hours and one of six, if the times are 7 a.m., 1 p.m., 10 p.m. The carbohydrate should be given partly at breakfast and mid-day with a relatively small amount at supper because no insulin will be taken before this meal. Other possible arrangements of three doses are (1) before breakfast, before a large tea with plenty of carbohydrate and at 9 or 10 p.m. to carry through the night; (2) a small dose in the early morning 5.30 or 6 a.m. which will prevent a bad test commonly encountered at 10 a.m.; a larger dose before breakfast and before dinner in the evening. Fortunately a third dose of insulin is not commonly required. In older patients the view may well be taken that the rather incomplete treatment with two doses of insulin does not really much matter. However, in children and young adults the greater part of their life is in front of them and the third dose is probably advisable and they certainly feel the better for it. In any case whether two or three injections of insulin are used each dose is to be looked on as independent of the others and can be varied in amount and as regards the interval between it and the meal without necessarily altering the other

doses and times. Recently Dr. Hagedorn has introduced protamine insulinate which is relatively insoluble so that the action of the insulin is prolonged and the blood sugar does not fall so low shortly after administration; this should diminish the number of doses required. Another way of avoiding the mid-day dose is to give a big dose before breakfast which will last on to the evening; a reaction at mid-day is prevented by prescribing some of the carbohydrate (say 1 CR) to be taken at 11 or 11.30 a.m.

The Self-Administration of Insulin.

Required: cotton wool, absolute isopropyl alcohol (*avantine*) and an insulin syringe. The pattern is recommended* (see Fig. 5) in which the needles fit into the syringe so that there is a smaller dead space and less insulin is left behind and so wasted after each injection.

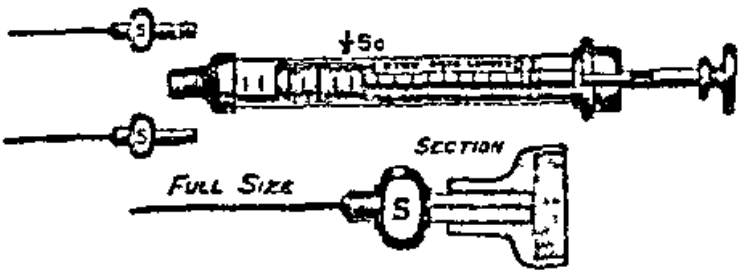


Fig 5.

A 1 c.cm. syringe, marked in units and supplied with a carrier and two needles Nos. 26 and 23, is fitted by means of a short piece of rubber tubing into a thick walled test tube containing the isopropyl alcohol, an antiseptic fluid; this fits into a cylindrical wooden case. Dr. O. Leyton has devised a travelling syringe in a metal case; two or three doses can be accommodated in the syringe by means of stops and each injected separately. The choice of a suitable fluid in which to keep syringe and needle is not an easy one. If methylated or rectified spirit is used the needles are apt to rust and methylated spirit also contains a number of undesirable substances, which are added to prevent the spirit from being used as a beverage. Absolute alcohol owing to the duty is very expensive except for patients at some hospitals; it costs about four times as much as isopropyl alcohol which is the next highest alcohol in the chemical series. Ether attacks the rubber tubing and acetone attacks the metal fittings of the syringe. Isopropyl alcohol has proved satisfactory and the author has to thank Mr. I. A. Robinson for suggesting its use. Professor Eyre kindly tested its antiseptic action against ordinary absolute alcohol and found it as effective.

* Made by Down Bros., Ltd., St. Thomas's Street, S.E.1.

Instructions for Use. After washing and drying the hands, remove the syringe and needles from the test tube. By running the plunger up and down several times, remove the alcohol as much as possible from the syringe and from each needle in turn. Fit the large bore needle into the syringe; put on one side the fine bore needle in the carrier. Suppose that 10 units (20 units per c.cm.—the original strength) is to be injected, place the plunger at the 10 unit mark, so that the syringe contains this amount of air. Clean the rubber cap of the insulin phial with a small piece of cotton wool moistened with the alcohol from the test tube. Pass the needle through the rubber cap into the insulin phial, which is then held upside down. Push the plunger home to expel the air into the phial. With the point of the needle lying beneath the level of the insulin, draw insulin into the syringe well beyond the 10 unit mark and push the plunger up to the mark, expelling the last trace of air from the syringe into the phial. Remove the phial of insulin. Withdraw plunger a little so as to empty the needle of insulin. Fit the fine bore needle and remove carrier. Holding the syringe vertically with the needle upwards, push up the plunger until it reaches the 10 unit mark and the needle will be found to be exactly filled with insulin. Clean the skin with the cotton wool moistened with the alcohol; hold the syringe in one hand; with the other (the left) pinch up some skin and subcutaneous tissue; pierce the skin at an angle of about 45°. Then letting go the skin hold the syringe with the left hand and push plunger home with the right, not too quickly. Remove needle, and see that no bead of insulin escapes from the hole in the skin; such a loss may be obviated by pulling the skin a little on one side before piercing it with the needle so as to make a valvular opening. Wipe the place lightly with the cotton wool. Wash out needle and syringe with the alcohol from the test tube and replace them, after filling up the tube with more of the alcohol as required.

The object of using two needles is to prevent the needle which pierces the skin from being blunted by being pushed through the thick rubber cap of the insulin phial; but in spite of this drawback many patients prefer the simpler method of using only one needle.

Insulin should be injected subcutaneously, not intra-muscularly. All parts of the body may be injected; but patients should not usually attempt to inject into their own arms. The favourite places are the front of the inner side of the thigh and the buttock, excluding the area over the ischial tuberosities, the bones on which the patient sits. Any part of the abdominal wall may also be used;

this forms an extensive area covered with soft skin and fat, ideal for the purpose; but for some reason not a favourite site with most patients.

Alternative method—less simple, but cheaper. The test tube into which the syringe is fitted is filled with methylated spirit or a mixture of tricresol in methylated spirit (1 in 20). There are also required methylated spirit, enamel bowl, cotton wool, and clean house-flannel to cover the bowl. At tea time the bowl is rinsed with boiling water from the kettle and then filled with boiling water; the bowl is covered with the house-flannel and allowed to cool. Before the injection the syringe and needles are removed from the test tube and washed out four or five times with the cold boiled water in the bowl so as to get rid of the spirit completely. The rinsings should not be allowed to run back into the bowl, nor should the hands touch either the water in the bowl or the stem of the needle. The water is removed as far as possible from the syringe and needles by moving the plunger up and down. The syringe is filled, the skin is cleaned with methylated spirit and the injection is made exactly as already described. After the injection the syringe and needles are washed out with the methylated spirit before returning them to the test tube. The bowl is again covered with the house-flannel and used for the early morning injection after which it is emptied out.

Nurses are sometimes taught to sterilize their needles and syringes by boiling them in water containing sodium carbonate (washing soda) and each time a dose is taken from the phial a little alkali may be introduced so that a medium suitable for bacterial growth is gradually made. A neutral or slightly alkaline solution of insulin shows turbidity; but if it is very alkaline the insulin may become clear again. It is evident that no alkali should be used in sterilization and no insulin should be used from a phial when the contents are turbid. To save expense patients should be taught how to sharpen their own needles by rubbing them very lightly on an Arkansas stone at four spots round the point; a minute drop of liquid paraffin is used as a lubricant. Sharpening may be controlled by examining the point with a "botany" lens shaped like a fountain pen or the low power of the microscope.

Insulin may now be obtained in solutions of three strengths. The original strength was 20 units per c.cm. and many insulin syringes are only graduated for this strength. "Double strength" 40 units per c.cm. is the most suitable strength for most cases. Quadruple strength, 80 units per c.cm. is suitable for the most severe cases. Many brands of insulin are available at present. Those

manufactured in this country are made mostly from beef pancreas, the American and Danish brands from pork.

Local Reactions.

Sometimes patients complain of stinging immediately after injection, owing to the acid in the insulin solution. This may be obviated by neutralizing it by drawing up into the syringe and mixing with the insulin, about half of its volume of centinormal caustic soda containing 0·25 per cent tricresol (Lawrence). The exact amount required varies with different brands, but enough should be used to cause a slight turbidity in the syringe from the precipitated insulin.

Urticarial wheals, coming up from six to twelve hours after injection, are a great nuisance, causing itching, pain and stiffness. The simplest plan is to change the brand of insulin using pork instead of beef and vice versa or to try some other brand of insulin made from the same animal. In addition to insulin solution Burroughs & Wellcome sell a very pure insulin in solid "tabloid" form, each of 10 units, which may answer the purpose. The required amount of solid is placed in the syringe after removing the plunger, which is then replaced. Cold boiled water is sucked up in which the tabloid dissolves; or the tabloid may be crushed up and dissolved in water in a small sterile cup, and then sucked up into the syringe for injection. Neutralization of the insulin does not appear to be of any use in stopping urticaria. None of these expedients was successful with one of the author's patients and he has learnt of two other cases from Dr. Graham. Believing that these reactions mean that the patient is sensitized anaphylactically to the insulin itself, Dr. Graham has tried desensitizing the patient by injecting a very small dose of diluted insulin (from a dilution of 1 in 100 with normal saline upwards) and increasing the dose at two hourly intervals, with complete success in both cases; but the resulting desensitization may only hold for the particular part of the body where these injections have been made. However, there is one comfort for the anaphylactic type of patient. Perseverance in the injections in spite of local trouble usually causes desensitization in the end and a brand of insulin not tolerated at one time may produce no local effect in the course of months.

Atrophy of the *subcutaneous fat* may occur when the injection is repeatedly made in exactly the same spot. The opposite condition of a *localized swelling* is commonly met with. It has been suggested that the antiseptic which is added in small quantity to insulin in the British Pharmacopoeia is really responsible, Dr. W. W. Payne[1]

has some evidence that this may cause fat atrophy. Two children affected in this way were treated with insulin which did not contain antiseptic; the atrophy disappeared though injections were continued at the same spot; further, in one subject, whose skin is specially sensitive to various irritants, a definite tissue response was obtained after an intradermal injection of 0·3 per cent tricresol. On the other hand there is no proof that the antiseptic causes the swellings. In a case of the author's insulin with tricresol was injected into one leg and insulin without tricresol into the other leg alternately; but there was no obvious difference in the amount of swelling. The way to avoid these complications is to vary the site of injection; but the difficulty is that patients often find that the injection is less painful if kept to a small area and children, especially, are loath to try a change. It is remarkable how rarely sepsis occurs at the site of injection.

Urine Testing.

Until a few years ago patients in the course of their treatment were instructed to collect in one receptacle all the urine passed through the twenty-four hours and this mixed urine was used for testing; but this method is inadequate. If sugar is present in the twenty-four hours' specimen, it may only be passed over short periods once or twice a day. If only a small amount of sugar is passed at one time, it will be diluted with a large volume of urine free from sugar and so its presence may be missed in the testing.

For these reasons the generally accepted practice is to collect and test each specimen of urine separately for sugar and for aceto-acetic acid too if the patient feels unwell. The best times for collecting are at 7 a.m. on waking, 10 a.m., 1 p.m., 4 p.m., 7 p.m., 10 p.m. and at an early morning hour if the patient wakes up to pass urine. (See Chart on page 25.) In hospital the times chosen will usually be one hour earlier. The exact times do not matter and they may be varied to suit the activities of the patient from day to day.

Benedict's Test for Sugar. 2 c.cm. (30 minims) of Benedict's Solution are added to three large drops (or four small drops) of urine in a test tube and boiled for three or four minutes. As there will usually be several specimens of urine to be tested at the same time, the tubes are conveniently placed in order in an enamel or aluminium mug or small saucepan filled with water and heated on a stove. A perforated metal cover may be fitted through which the tubes project so as to keep them separate and in order. They should remain in the boiling water for four or five minutes. Care should be taken that the Benedict's Qualitative Solution is supplied not the

Quantitative Solution which gives with sugar a scanty white precipitate on boiling. The solution is best measured out of a 25 c.cm. measuring cylinder and a glass dropper or fountain pen filler is used for the urine. The following convenient notation may be used when the tubes are examined immediately after heating :—A faint green turbidity which is translucent—T (trace) corresponding to about 0·2 per cent sugar; a green precipitate—1, i.e. 0·3 to 0·5 per cent sugar; a yellowish green precipitate—2, i.e. 0·9 to 1·1 per cent sugar; a pure yellow or copper coloured precipitate—3. In the last case, when the precipitate settles on standing, the liquid above will be colourless, indicating that all the copper has been removed from the solution; if the liquid still remains blue, the result may be called 2½. Similarly a 1½ result is intermediate between 1 and 2. If the turbidity is so slight that the presence of sugar is doubtful ? T may be used. (See Chart on page 25.)

Rothera's Test for Ketosis. A mixture is made containing 1 part of powdered sodium nitroprusside and 100 parts of ammonium sulphate, which keeps indefinitely in a dark bottle. Some of this is placed in a test tube and covered with urine, the tube is shaken to produce a saturated solution of the sulphate and a few drops of 50 per cent ammonia are added. The following notation may be used when the tube is examined after five minutes :—a pink colour—T (trace); a purple colour like Condy's fluid—1; when the colour is so dark that the tube is no longer transparent—2; when this opacity develops within two minutes—3.

Gerhardt's Test for Ketosis. Liquor ferri perchlor. B.P. is added by slow degrees to some urine in a test tube. A precipitate of ferric phosphate first forms, which is dissolved on adding more of the reagent. If positive, a Burgundy red colour is obtained. This test is also given if the patient has been taking salicylates, aspirin, etc. or if the urine is very alkaline, so that Rothera's test is recommended for general use.

Management of Case.

When treatment is first begun, injections of 4 or 5 units are given half an hour before breakfast and supper. The dose is increased by 4 or 5 units every two or three days. The sugar in the urine becomes less and eventually disappears. At this stage the renal threshold may be determined. A time in the day is chosen when the blood sugar is fairly constant. A good time is 4 to 6 p.m. before the evening insulin and a long time after an important meal. The bladder is emptied at say 5 p.m. and the urine discarded; it is emptied again at 5.15 p.m., when the first specimen for testing

is obtained as well as a specimen of blood for a blood sugar determination. The bladder is emptied a third time at 5.30 p.m. when the second specimen for testing is obtained. This specimen will have been secreted by the kidney during one particular ½ hour, at a time when the blood supply to the kidney contained a known quantity of dextrose. If a trace of sugar is present in the urine the blood sugar determination will indicate what concentration of sugar in the blood is required for the kidney to excrete it in small quantity—in other words, it indicates the threshold or the leak point of the kidney. The result will be the more certain if the first specimen also contains a trace of sugar. In actual practice, on one day the urine may contain more than a trace of sugar; on a later day it may contain none and the threshold will fall somewhere between the two blood sugar values.

The threshold can readily be estimated in this way. This determination is very important because, if the threshold is normal (0·16 to 0·18 per cent), the absence of sugar in the urine, tested at frequent intervals in the twenty-four hours, will indicate that the blood sugar has never been too high; but if the threshold is low, as is the case with quite a large number of diabetics, a constant succession of free tests will not be expected and green tests may be neglected. Again, if the threshold is high, urine tests will be of little value because the urine will always be sugar free; but it is the experience of the writer, that high thresholds may rapidly become normal when insulin treatment is undertaken. Occasionally the threshold rises after being low.

After the final disappearance of the sugar from the urine the increase of insulin may still be continued in the uncomplicated case, until the patient experiences a very mild hypoglycaemic reaction two to six hours after the dose, such as a feeling of hunger or shakiness or other symptoms described later under Hypoglycaemia. By this means the patient experiences at an early stage, and while under medical supervision, exactly what it feels like to receive a small overdose of insulin. His future treatment will be carried out with greater confidence for this experience. The maximum dose tolerated by the patient will be just less than that which causes symptoms and this is the dose to be prescribed, since it will keep the blood sugar normal and the urine permanently sugar free, if the threshold is normal.

By such means blood sugar examinations can be dispensed with to a large extent. Great care must be taken when complications are present. In the case of angina pectoris, heart failure, phthisis or other infections the insulin should not be pushed to the extent of

causing hypoglycaemia as otherwise an attack or an exacerbation of the condition may be brought on. Patients showing extreme wasting are very readily made hypoglycaemic by quite small doses of insulin; the insulin should be only slowly increased and plenty of carbohydrate should also be allowed. On the other hand in cases of sepsis large amounts of insulin are required.

TABLE E

PROGRESS OF CASE

	INSULIN.		URINE TESTS.								
Year. 1930. Date.	Time before breakfast. Units ½ hr.	Time before supper. Units ½ hr.	Benedict (S). Rothera (K).	7 a.m	10 a.m.	1 p m.	4 p.m.	7 p.m.	10 p.m.	Extra Tests.
Oct.										
15	0	0	S	3	3*	3	3	3	3	
			K	3	3	3	3	3	2	
16	4	4	S	3	3	3	3	3	3	
			K	2	2½	2½	2½	2½	1	
17	8	8	S	1½	3	3	3	3	2½	
			K	T	T	T	1	2	1	
18	10	10	S	1	3	3	2	2	2½	
			K	T	0	0	T	1	1	
19	12	12	S	T	3	2	0	0	1	
			K	0	0	0	0	T	T	
20	14	12	S	0	3	0	0	1†1½	3	
			K	0	0	0	0	1	T	
21	10	14	S	0	3	1	1	T	0	
			K	0	0	T	0	T	0	
	¾ hr.	¾ hr.								
22	18	18	S	0	3	1	1	1	1	
	1 hr.	1 hr.								
23	20	20	S	0	2½	0	2½	1	0	
24	26	20	S	0	1½	0	2½	1	T	
25	28	22	S	0	0	T	1½	T	?T	
26	28	22	S	0	T	1½	1½	2	T	
	1¼ hr.	1 hr.								
27	30	22	S	0	0‡0	§R 0	0	1	T	12 midt. R
28	26	24	S	0	1	0	1½	T	T	
29	26	20	S	0	2½	T	0	1	0	
	1¼ hr.	1¼ hr.								
30	26	18	S	1	2	0	1½‖ 1½	T	T	
31	26	18	S	0	1	0	0	0	T	
Nov.										
1	26	18	S	0	2	0	0	0	T	
2	28	18	S	0	2½	1	0	1	T	
3	28	18	S	0	1¶ 1½	T	2	1	T	

Blood Sugar, mg. %	*0·260	†0·150	‡0·080	§0·056	‖0·150	¶0·115
Time	10.15 a m.	5.30 p.m.	9.30 a m.	12	2 50 p.m.	9.45 a.m.

R = Reaction.
Threshold or leak-point = Low—under ·110, above 0·080.

is obtained as well as a specimen of blood for a blood sugar determination. The bladder is emptied a third time at 5.30 p.m. when the second specimen for testing is obtained. This specimen will have been secreted by the kidney during one particular ½ hour, at a time when the blood supply to the kidney contained a known quantity of dextrose. If a trace of sugar is present in the urine the blood sugar determination will indicate what concentration of sugar in the blood is required for the kidney to excrete it in small quantity—in other words, it indicates the threshold or the leak point of the kidney. The result will be the more certain if the first specimen also contains a trace of sugar. In actual practice, on one day the urine may contain more than a trace of sugar; on a later day it may contain none and the threshold will fall somewhere between the two blood sugar values.

The threshold can readily be estimated in this way. This determination is very important because, if the threshold is normal (0·16 to 0·18 per cent), the absence of sugar in the urine, tested at frequent intervals in the twenty-four hours, will indicate that the blood sugar has never been too high; but if the threshold is low, as is the case with quite a large number of diabetics, a constant succession of free tests will not be expected and green tests may be neglected. Again, if the threshold is high, urine tests will be of little value because the urine will always be sugar free; but it is the experience of the writer, that high thresholds may rapidly become normal when insulin treatment is undertaken. Occasionally the threshold rises after being low.

After the final disappearance of the sugar from the urine the increase of insulin may still be continued in the uncomplicated case, until the patient experiences a very mild hypoglycaemic reaction two to six hours after the dose, such as a feeling of hunger or shakiness or other symptoms described later under Hypoglycaemia. By this means the patient experiences at an early stage, and while under medical supervision, exactly what it feels like to receive a small overdose of insulin. His future treatment will be carried out with greater confidence for this experience. The maximum dose tolerated by the patient will be just less than that which causes symptoms and this is the dose to be prescribed, since it will keep the blood sugar normal and the urine permanently sugar free, if the threshold is normal.

By such means blood sugar examinations can be dispensed with to a large extent. Great care must be taken when complications are present. In the case of angina pectoris, heart failure, phthisis or other infections the insulin should not be pushed to the extent of

causing hypoglycaemia as otherwise an attack or an exacerbation of the condition may be brought on. Patients showing extreme wasting are very readily made hypoglycaemic by quite small doses of insulin; the insulin should be only slowly increased and plenty of carbohydrate should also be allowed. On the other hand in cases of sepsis large amounts of insulin are required.

TABLE E

PROGRESS OF CASE

	Insulin.		Urine Tests.								
Year. 1930. Date.	Time *before* breakfast. Units ½ hr.	Time *before* supper. Units ½ hr.	*Benedict* (S). *Rothera* (K).	7 a.m.	10 a.m.	1 p.m.	4 p.m.	7 p.m.	10 p.m.	Extra Tests.
Oct.										
15	0	0	S	3	3*	3	3	3	3	
			K	3	3	3	3	3	2	
16	4	4	S	3	3	3	3	3	3	
			K	2	2½	2½	2½	2½	1	
17	8	8	S	1½	3	3	3	3	2½	
			K	T	T	T	1	2	1	
18	10	10	S	1	3	3	2	2	2½	
			K	T	0	0	T	1	1	
19	12	12	S	T	3	2	0	0	1	
			K	0	0	0	0	T	T	
20	14	12	S	0	3	0	0	‡‡½ 1	3	
			K	0	0	0	0	1	T	
21	10	14	S	0	3	1	1	T	0	
			K	0	0	T	0	T	0	
	½ hr.	½ hr.								
22	18	18	S	0	3	1	1	1	1	
	1 hr.	1 hr.								
23	20	20	S	0	2½	0	2½	1	0	
24	26	20	S	0	1½	0	2½	1	T	
25	28	22	S	0	0	T	1½	T	?T	
26	28	22	S	0	T	1½	1½	2	T	
	1½ hr.	1 hr.								
27	30	22	S	0	0†0	§R 0	0	1	T	12 midt. R
28	26	24	S	0	1	0	1½	T	T	
29	26	20	S	0	2½	T	0	1	0	
	1½ hr.	1½ hr.								
30	26	18	S	1	2	0	1½‖ 1½	T	T	
31	26	18	S	0	1	0	0	0	T	
Nov.										
1	26	18	S	0	2	0	0	0	T	
2	28	18	S	0	2½	1	0	1	T	
3	28	18	S	0	1¶ 1½	T	2	1	T	

Blood Sugar, mg. %	*0·260	†0·150	‡0·080	§0·056	‖0·150	¶0·115
Time	10.15 a.m.	5.30 p.m.	9.30 a.m.	12	2.50 p.m.	9 45 a.m.

R = Reaction.
Threshold or leak-point = Low—under ·110, above 0·080.

A Progress Chart. The author has found a progress chart useful and such a chart has been kept up for years by private patients and out-patients alike. The treatment with insulin of an uncomplicated case of diabetes is shown in Table E. The insulin with the time before meals is entered on the left hand side; the tests for sugar and ketosis on the right hand side. As the dose of insulin is increased the sugar in the urine lessens and ketosis disappears. Insulin reactions are marked as R. The times of blood sugar determinations and the values are given below; but the determinations are also marked on the chart and the figures before and after indicate the intensity of the Benedict test. The low renal threshold in this case is shown by the last two blood sugar tests and especially the last test at 9.45 a.m. on November 3rd, when the blood sugar was 0·115 per cent, while the urine in the next 15 minutes gave a 1½ test for sugar. Consequently it was inadvisable in this case to make the urine sugar free.

The Carbohydrate to Fat Ratio.

The diet treatment of diabetes has turned through a whole circle since Rollo at the end of the eighteenth century cut down the carbohydrate and increased the protein and fat. About 100 years later it was beginning to be realized that such treatment commonly precipitated diabetic coma, the most dreaded complication of diabetes. At the same time the value of a low Calorie diet was discovered as the result of clinical experience in the siege of Paris. Consequently carbohydrate was again prescribed; periods of a day or two's dieting with carbohydrate alternated with protein and fat of low Calorie value in Von Noorden's oatmeal and potato cure; fasting followed by low Calorie low carbohydrate diets became popular owing to the work of Guelpa and Allen. This was the state of affairs when Banting made his great discovery of insulin in 1921. At first most physicians continued with the same type of diet; but the change to a more normal diet has been taking place during the last ten years. The author,* after reviewing his cases, decided to make the change in the Autumn of 1928, though a number of physicians were using higher carbohydrate diets much earlier than this; for instance, Aldersberg and Porges in Vienna, Chabanier in Paris and Sansum in America, while Banting himself and Nixon in this country used a moderate amount of carbohydrate as soon as insulin was introduced.

The reasons for a higher carbohydrate diet may be summarized as follows: It is much more pleasant for the patient; carbohydrate

* Preface, *loc. cit.*

tends to increase sugar tolerance and there is good evidence that it does this by stimulating the islands of Langerhans in the pancreas to produce more insulin in the body, though there are other possible factors in the liver and pituitary gland. Provided the Calorie value of the diet is kept on the low side, the amount of insulin required is often less than with the high fat diet and there is a tendency for the insulin requirement to become less under treatment. Most important of all there is evidence that the high fat diets of the past may have been responsible for the arteriosclerosis[2] and possibly the other complications such as cataract and retinitis that are so commonly met with in diabetes.

What is the ratio of carbohydrate to fat that is usually taken by healthy people? Judging by the observation of Cathcart, Murray and Shanks,[3] this ratio for unskilled workers is 4 to 1, for shopkeepers 3·4 to 1 and for the professional classes 3 to 1 and children probably prefer a ratio of 4 to 1. For a diabetic patient particularly when he has been accustomed to a ratio of 1 to 1 or less a change over to 2 to 1 will be much appreciated and the amount of carbohydrate will be sufficient to abolish ketosis; he might prefer this to taking the higher carbohydrate diet of the general population. On the other hand there would be no reason why a carbohydrate to fat ratio of 3 to 1 should not be given to an adult who was beginning treatment. Children very often do well with a ratio of 4 to 1 or 5 to 1; increased activity has been noticed; but, if the total Calorie value of the diet remains the same, there does not appear to be any marked difference in the insulin requirement over a period when the C to R ratio has been changed from 2 to 1 to 5 to 1.[4]

After deciding the carbohydrate to fat ratio the diet formula will be chosen from Table 1 (Appendix) according to the Calorie requirement of the patient and the amount of protein allowed. Then a weekly series of menus should be arranged, for accuracy will more readily follow a fixed routine. The help of the dietician might well be enlisted in arranging the alternative diets and diabetic patients may also be willing to assist one another in this. One of the author's patients has been very helpful. After a little practice the protein will be readily adjusted so as to agree with the amount given in the formula; the separate table containing the pure protein foods may be used; but no great accuracy is usually necessary. The variation in the fat of cooked flesh foods makes most dieting rather inexact, except that, since average values are given, the irregularities will tend to cancel each other over a period.

Choice of Treatment.

For obese patients with mild diabetes a reducing diet may be ordered in the first place without insulin, as described under obesity. Insulin would be given if the blood sugar still remained too high or if the patient still felt below par; but usually they feel much better. A high carbohydrate low fat diet, e.g. G, H or N is very suitable.

For patients of normal weight diet treatment may be instituted at first if desired; if the habits are sedentary not more than 10 or 15 per cent above the basal Calorie requirement should be allowed and the carbohydrate to fat ratio should not be less than 2 to 1. A high carbohydrate low fat diet may be well tolerated owing to its bulk. Diet treatment will only really be successful if it is found to be possible to keep the blood sugar normal and the urine free from ketone bodies and the patient is at the same time free from symptoms. Otherwise insulin will be required. The only object in ordering a preliminary fast is to clear up the sugar quickly; there will be no permanent effect

For wasted patients the diabetes will be severe and insulin should be given at once. The patient should rest at first and a diet based on the predicted weight should be given with a carbohydrate to fat ratio of 3 or 4 to 1 (D-H). When wasting is extreme the glycosuria is often slight and severe hypoglycaemic reactions are apt to occur if the carbohydrate intake is kept too low. If insulin is refused fasting may be of value to produce a rapid fall of blood sugar and stop ketosis and glycosuria, the diet may then be worked up on the ladder principle until a reasonable Calorie value is obtained; but the author does not see that there is much advantage in this plan over the simple one of giving an adequate fixed diet in the first place and allowing the patient gradually to adjust himself to it. It may take a little less time. If there is ketosis the high carbohydrate low fat diet—ratio 5 or 6 to 1—might be given.

For children and young adults. Treatment with insulin should be begun as soon as the disease is diagnosed. These patients have almost invariably done very badly in the past before the days of insulin and there is no reason for supposing they will do any better now if insulin is not used.

Other Special Cases. In heart failure or threatening heart failure dextrose or ordinary sugar or dextrimaltose may be ordered two, three or more times a day with insulin beforehand. If insulin is given frequently only quite small amounts may be required;[5] in all the daily dose may be smaller than when it is only given twice a day and special care must be taken to avoid insulin reactions.

The sugar must be taken into account when the rest of the diet is calculated. I is such a diet of 1,600 Calories (see Appendix). Many patients are obese and a reducing diet is advisable, such as S. *This plan should be adopted to lower the basal metabolism in preference* to thyroidectomy. When a low fat diet is taken for any length of time, care must be taken to see that there is a supply of Vitamins A and D (pages 49-50). Excess of fluid should not be taken.

In renal insufficiency which is dealt with more fully on page 48 and in cases of arteriosclerosis and also high blood pressure a low protein diet such as L, M or N will be advisable and the intake of purines should be restricted as in Diet O (see page 111). Excess of salt should also probably be avoided. A low purine diet will also be advisable in gout. By increasing the amount of fruit and vegetables in such a diet and substituting as far as possible potatoes for bread it will become an alkaline diet (see page 63, Diets T, U). Recent experiments of Govaerts suggest that high blood pressure is due to the presence in the serum and cerebrospinal fluid of a substance similar to tyramine, a derivative of protein. This accords with the clinical experience that such patients feel better on a low protein diet.

Other complications that require insulin and plenty of carbohydrate are angina pectoris or cardiac pain, chronic sepsis, visual disturbances due to cataract, retinitis, etc. The same applies to phthisis where, however, a rather more liberal diet is advisable.

The medical man should be prepared at any time to give insulin with plenty of carbohydrate if acute disease develops, such as influenza, tonsillitis, bronchitis, pneumonia, boils and carbuncles.

A question very commonly asked is " If I begin insulin is there any chance of my being able to leave it off ? " The answer to this depends on the state of the patient. If a patient who is wasted puts on fat by means of insulin and if there is no improvement in the pancreatic function, then, if insulin is suddenly stopped, the patient will be in a much worse position than if no insulin had been given and the patient had remained thin, because the fat will be formed quickly into ketone bodies and coma may supervene. If insulin does not cause any increase of weight then it may be omitted with safety, at any rate for the time being. In some cases of mild diabetes, especially in the elderly, the improvement under insulin has been so marked that the patient has been able to omit it altogether.

A patient with diabetes should not look upon insulin as an enemy to be avoided at all costs and for as long as possible. Rather insulin is a friend in need. He may require some knowing ; some

getting used to; but he will make all the difference to the comfort of life. The injection, even though it should usually be made twice a day, involves only the smallest bit of routine; it is shorter and easier than shaving or doing the hair. While taking insulin the patient may not only be able to have a liberal diet; but if the diet and insulin are correctly adjusted, he should feel a normal person.

After-Treatment.

Patients must be taught to administer insulin to themselves and should know how to test the urine for sugar and ketone bodies. They should be taught the main facts about the disease; full explanation about diet should be given. In the ordinary cases the dose of insulin should be the maximum that the patient can tolerate without producing symptoms. With a normal threshold the urine should always be sugar free and the Rothera's test for ketosis always negative. A positive Rothera's test may occur when too little insulin is being used so that the blood sugar remains above normal; but it is also due to there being too little carbohydrate or too much fat in the diet and some modification should be made if this is the case. Patients should take less insulin if they are to take unaccustomed muscular exercise, since the latter tends to lower the blood sugar. For this reason while the insulin is being finally adjusted the patient should be up and about taking his usual amount of exercise. A patient treated along the lines just laid down may find after a time that the dose of insulin to which he is accustomed is becoming too large, since he is experiencing hypoglycaemic reactions. This may mean that he is improving and the dose must be diminished.

Infection. When the patient gets any acute infection such as tonsillitis, influenza, measles, pneumonia, gastro-enteritis etc. the call of the body for insulin is increased. (*a*) If the usual food is being taken, the ordinary dose of insulin is given. The urine should be tested every two or three hours and if sugar appears a fresh dose of insulin should be taken before the mid-day meal or at midnight (an extra feed being given). A gradual increase in the dose may also be necessary; but the insulin must, of course, be diminished as soon as the temperature falls and the urine remains sugar free. (*b*) Suppose that no food is being taken (e.g. if there is vomiting). (1) If the urine contains sugar, the full dose of insulin should be given at the usual time and the urine should be tested every two or three hours with fresh additions of insulin as has already been described. (2) If the urine does not contain sugar, one-quarter the usual dose of insulin should be given and the urine tested every two or three hours and fresh doses of insulin given if necessary. Particular

care must be taken to look for ketosis in infection, especially when there is vomiting; extra glucose and insulin may have to be given.

The Common Cold[6] lowers sugar tolerance in diabetes and, if neglected, may cause bronchitis or pneumonia. To prevent it chill must be guarded against by extra clothes in cold weather: the daily cold bath, which exercises the vasomotor system, may not be practicable for a diabetic. If contact with an infectious person is necessary a handkerchief may be held up to cover the nose and mouth. Concentrates of vitamins A and D may be taken and there is evidence in favour of preventive inoculation against those bacteria that are secondary invaders; the causal organism is a filterable virus. Glegg's mixture—paraffinum liquidum three parts, paraffinum molle one part, rosettol q.s., should be applied in massive doses to the mucous membrane of the nose and nasopharynx, if there is fear of infection or as soon as there is the slightest feeling of rawness in the throat. It is supplied in collapsible tubes (British Drug Houses) or may be obtained in bulk and applied by means of a nasal pipette (supplied by Down Bros.). In slight cases the application should be made night and morning, otherwise four-hourly, while lying down. If the nose is blocked menthol gr. $\frac{1}{2}$ is added to 1 oz. of the mixture; but the newly-introduced benzedrine inhaler is also valuable.

Operations. If an operation becomes necessary, local, regional or spinal anaesthesia are the safest methods to employ. Next comes gas and oxygen and lastly general anaesthesia with ether or chloroform, which tend to increase the severity of the diabetes. A dose of glucose up to 50 grm. should be given about 30 minutes beforehand and half an hour before this a dose of insulin, which in a mild case would be in the proportion of one unit to 4 grm. glucose and in a severe case a higher proportion of insulin should be used.

[3] *W. W. Payne and A. G. Signy, Lancet, 1, 1421, 1931. See also, R. Priesel and R. Wagner, Zeitsch. f. Kinderheilkunde, 46, 453, 1928.*

[4] I. M. Rabinowitch, *Ann. Int. Med.*, 8, 1436, 1935.

[5] A study in nutrition, Med. Res. Council, 1931. Spec. Rep. Ser. No. 151.

[4] E. P. Poulton, *Proc. Roy. Soc. Med.*, 26, 1591, 1933.

[5] A. Ellis, *Quart. J. Med.*, 3 N.S., 137, 1934.

[6] E. P. Poulton and F. A. Knott, *Practitioner*, 136, 24, 1936.

Chapter III

TREATMENT OF SOME COMPLICATIONS OF DIABETES

Hypoglycaemia.

In the treatment of diabetes with insulin the blood sugar commonly reaches its lowest value from two to six hours after injection. When the value is too low the condition is known as hypoglycaemia and symptoms result; the patient experiences a " reaction ", also called " insulin shock ". The common symptoms of a mild reaction are, shakiness, sweating, hunger, emptiness and nausea, giddiness or dizziness, mental disturbances (such as anxiety, excitement, depression, confusion), headache, palpitations and irregularity of the heart, weakness and exhaustion, blurring of vision, feeling of cold, diarrhoea, transient hemiplegia. These are arranged roughly in order of frequency; the hemiplegia is very rare. Sometimes the patient may behave like a drunken man and perform actions that he will later on regret. On the other hand he may behave normally, but remember nothing that he has been doing for an hour or so. If the patient becomes hypoglycaemic during sleep it usually wakes him up. Children may become restless, irritable or thoroughly naughty and a little cyanosed; in such cases a lump or two of sugar may act like a charm when a parental scolding has no effect at all. Thus the clinical picture of hypoglycaemia is extremely variable; though usually the symptoms of a reaction are constant for the individual yet sometimes they change completely, which is very disconcerting because the patient may not realize what is happening. Very occasionally the first symptom noticed is a feeling of complete inability to do anything and the patient can only sit or lie down. This is very alarming; but even if nothing is done the reaction will wear itself out in time and the patient come round.

Hypoglycaemic or *insulin coma*, which is quite different from diabetic coma, is the end result of poisoning by insulin and this has proved fatal; but a fatality must be extremely rare at the present day now that knowledge about insulin is widely diffused. The associated symptoms are to a certain extent the converse of those in diabetic coma. There is profuse sweating, the pulse is full and bounding, the veins stand out prominently. There may be some oedema of the lungs with cyanosis and fluid expectoration and the respiration may be shallow and infrequent. The patient, especially

if a child, may be convulsed and may bite the tongue as in epilepsy; the tendon reflexes are exaggerated, the plantar reflexes extensor and there is loss of control of sphincters. There are usually no sugar or ketones in the urine; but a reaction may be associated with a temporary ketosis and if the threshold is very low there may be sugar.

There are two rules to remember in diagnosis. The first is the time of onset of the symptoms, which is commonly before lunch or on going to bed or on waking up in the early hours of the morning, or at about breakfast or supper time if the time of the insulin administration has been pushed forward. Any unusual symptoms at these times should lead the doctor and patient to suspect hypoglycaemia. In a patient of the author's, a girl aged 13, after a big morning dose the symptoms are usually delayed, coming on at 4 p.m. The second rule is when there is doubt two lumps of sugar should be taken followed in ten minutes by another one or two lumps and so on as required. If the symptoms clear up proof of the reaction has been obtained. It is rarely possible to obtain a specimen of blood for a blood sugar determination; but this would provide additional proof.

It is unlikely that a diabetic treated efficiently will go through his life without feeling even a mild reaction, in the same way as a normal man may feel faint with hunger if his meal is long delayed. Serious reactions are more likely to affect wasted patients at the beginning of treatment. Exercise on an empty stomach is the commonest cause because extra sugar will be burnt up and so the supply in the body will be lowered. Patients must realize this and take less insulin, when they know that they are going to take unusual exercise such as going for a long walk, playing golf or tennis, bicycling or swimming; they will soon learn what reduction they must make. A fruitful source of a reaction is refusal on the part of the patient to follow the instructions of the doctor. The recovery of pancreatic function that takes place early in treatment is shown by the occurrence of mild reactions which may come on in a month or two after beginning insulin, when the patient is no longer under the continual medical supervision that is required at the beginning of treatment. Instead of reducing the dose at once as he has been told, he considers it praiseworthy to struggle against Nature. Then one day he takes an unaccustomed walk after the injection and falls down unconscious.

A reduction of blood sugar to 0·07 or 0·06 per cent will commonly cause some symptoms in adults; but in children lower values may be reached before symptoms appear. In certain untreated cases of diabetes, where the blood sugar has been too high for a long time, reactions may be experienced at much higher

levels of blood sugar such as 0·09, 0·12 or even 0·18 per cent, presumably because the body has for long been adapted to the hyperglycaemia. In such cases it is inadvisable to bring the blood sugar into the normal range.

In a woman with a high renal threshold for sugar studied by W. W. Payne and the author[4] in 1923 symptoms were experienced with a blood sugar of 0·25 per cent and over; on two different occasions at 1½ years' interval it was found that the symptoms took place while the blood sugar was falling and they were abolished by taking food, even though the blood sugar continued to fall for some minutes. It is difficult to explain such a result. The prognosis in such a case might be considered bad, because most of the time the blood sugar would have to be kept much above normal; actually the patient is alive and well at the present day.

When, owing to some error insulin has been given in grossly excessive amounts for some time, a permanent state of mental deterioration has been observed. In a case reported to the writer the patient came into a hospital drowsy, with a carbuncle; the blood sugar was 0·4 per cent. She was given 1,000 units and in spite of repeated doses of dextrose she remained drowsy without speaking for three weeks, when she died.

Treatment. For a mild reaction the patient should take one or two lumps of sugar, and a further lump in ten minutes' time and again in another ten minutes. It is of course possible to imagine a reaction that does not really exist; but in the author's experience the common thing is to fail to recognize a reaction that does exist. Patients should always carry three or four lumps of sugar about with them in their pockets in case of accidents. It has been suggested that they should wear round their necks inside the shirt a label which should state that some sugar should be given to them at once, if they are picked up unconscious. Such a precaution should certainly be followed if the attack usually begins with a general weakness or paralysis. An injection of adrenaline may also be given (see below).

For a severe reaction or for hypoglycaemic coma a subcutaneous injection of 15 to 20 minims of adrenaline (1 in 1,000) should be given, or failing this the same dose of pituitrin (post-pituitary extract). If the patient's insulin syringe is used, it is filled with the adrenaline solution up to the 20 mark or over (single units). Alternatively a tablet containing 0·001 grm. adrenaline (P.D. & Co.) is put into a syringe and previously boiled water out of a kettle, or tap water is sucked up to the 1 c.cm. or 20 unit mark. The patient's friends should be taught this treatment for an emergency.

An ounce of powdered dextrose, glucose or ordinary cane sugar is dissolved in ¾ pint of tap water and the patient is made to drink it. If this is impossible, the mouth is held open with the handle of a spoon and a stomach tube is pushed down the throat into the stomach. The sugar solution is allowed to run through a funnel down the tube into the stomach. It should be warmed up to blood heat (100° F.) first of all if there is time; if the tap water has already been boiled in a kettle so much the better, but in an emergency this does not matter. This treatment should be carried out by a doctor; but if the doctor is not available it may be carried out by one of the patient's friends or relations. Provided the tube has been passed well down to a distance of 20 inches no harm can possibly result. A more concentrated solution should not be used, as it will remain longer in the stomach before being discharged into the bowel where it is required. A diabetic patient should always keep by him at home the required amount of powdered dextrose, a pint measure, and a stomach tube and funnel, in case of emergency.

A simpler alternative procedure, if the patient is unconscious, is to give an intravenous injection of sterile glucose; a quicker result will be obtained than with the stomach tube. Ampoules are sold containing dextrose in a 50 per cent sterile solution and this can be injected slowly into an arm vein. Such an ampoule may well form part of the doctor's emergency equipment. If the dextrose solution had to be made up specially for the emergency and sterilized, it would be quicker to use a stomach tube.

Fitness to Drive a Motor Car. According to the present law an applicant for a driving licence has to fill in a declaration as to his physical fitness. The first question is "Do you suffer from epilepsy or from sudden attacks of disabling giddiness or fainting?" And if in doubt he is advised to seek professional advice. The only question that arises in a diabetic is the possibility of hypoglycaemic symptoms coming on while driving, which would render him unfit to be in charge of a motor vehicle. If the patient is intelligent and has been treated properly and knows about the gradual improvement in pancreatic function that may occur in course of time, the effect of muscular exertion, the nature of the early symptoms of hypoglycaemia and their usual time of onset and the alteration of dosage required, there should be no possibility of hypoglycaemia while driving a car, especially as the exertion of doing so cannot be considered excessive for a trained man. It would be his own fault if he was overtaken in this way. And this to the writer is the kernel of the matter. It is the man's own fault if he is incapable when he is in charge of a car, whether the cause be too much alcohol or

too much insulin, and the penalty is presumably the same in both cases. Providing the patient realizes all these points, he should be allowed to answer the question in the negative.

But while this is true in the majority of cases there are a few patients with moderately severe diabetes who in spite of careful treatment do get hypoglycaemic attacks, apparently without adequate cause. One of the special symptoms may be obstinacy, which refuses to recognize the condition, and although during the attack they may avoid an accident, because their reflexes are good, such patients should certainly not be allowed to drive a car.

Diabetic Coma.

This name is given to a group of symptoms, which are due to the accumulation in the blood of aceto-acetic or diacetic acid ; this acid acts as a poison to the circulation and the brain. In many cases a second factor is also present. The kidneys normally destroy as well as excrete ketone bodies ; but when they have been deluged with them over a long period they become injured so that their general excretory function deteriorates and " uraemia " is present as well as diabetic coma. Uraemia is a very serious complication because while diabetic coma is treated by means of insulin, uraemia is not affected and may cause death. The increased breathing movements in diabetic coma or air hunger are probably mainly due to the increased acidity of the blood.

The other clinical features are a rapid feeble pulse, collapsed veins, dry skin, coldness of the extremities, diminished intraocular tension, concentrated and viscous blood, and a smell of acetone in the breath ; these are all very characteristic. The patient lies with the eyes half open, taking no notice of his surroundings ; and though he can be roused by a question, he answers in a dazed manner, as if only half comprehending it. He becomes quite comatose before death. The predisposing causes of diabetic coma are a diet rich in protein and fat ; excitement or emotional shock ; general anaesthesia without insulin ; acute infections ; impaired function of the kidneys ; constipation ; failure to continue the use of insulin in a young patient, who has put on fat by its help.

Treatment. At the beginning of diabetic coma a large dose of insulin, e.g. 60 units, should be given in part subcutaneously and in part intravenously and a subcutaneous injection of 40 units should be given every four hours, until the urine becomes free of sugar and ketone bodies ; insulin is then stopped until sugar appears again in the urine and it is then continued in smaller doses at longer intervals. It is important to test every specimen of urine for sugar as it is

passed and to catheterize the patient in order to get a specimen, if there has been no urine to test for three or four hours. The reason for these precautions is that with the vigorous treatment necessary for diabetic coma it is very easy for the patient to pass into hypoglycaemic coma without any intermediate return of consciousness. This can also be guarded against by giving glucose by mouth or intravenously 2-3 grm. for every unit of insulin.

The administration of fluid is a most important part of the treatment, and in an unconscious patient it can be given by a fine tube through the mouth or through the nose. The following is a good formula, which counteracts the loss of minerals in a severe case of diabetes: glucose, 3 per cent; sod. bicarbonate, 0·5 per cent; potassium chloride, 0·05 per cent; calcium chloride, 0·03 per cent. To prevent alkalosis the sodium bicarbonate would be replaced by a further 2 per cent of glucose after four hours, unless the breathing still remains deep. If these solutions cannot be made up, 1 per cent bicarbonate may be used alone for four hours and subsequently 5 to 6 per cent glucose or cane sugar or normal saline (0·9 per cent) or a mixture of these two. A pint of such an isotonic solution should be given every hour; but it is necessary to keep a look-out on the bases of the lungs to prevent pulmonary oedema. The patient should lie over on the right side so as to allow the fluid to gravitate towards the duodenum, but a warning must be given that sometimes, owing to spasm of the pylorus, the fluid does not get through to the intestines, but remains in the stomach distending it. This may perhaps be recognized by noting whether the upper abdomen becomes full and whether there is a succussion splash on shaking the patient. Again if the patient vomits the actual duration of the administration should be prolonged, or the solution should be given intravenously. It is very important to keep the patient in the recumbent position owing to the feeble circulation. From 24 to 48 hours of such treatment will be required before the patient becomes fully conscious after being in deep coma.

Prevention and Treatment of Gangrene and Sepsis.

The following instructions are given by McKittrick and Root[2]; they have been modified a little: (1) Wash the feet daily with soap and water. Dry thoroughly, especially between the toes, using pressure rather than vigorous rubbing. (2) If the skin is hard, rub well with hydrous lanolin as often as necessary to keep the skin soft; make it supple and free from scales and dryness, but not enough to render the feet tender. If the nails are dry and brittle, soften them by soaking them in warm water one half hour each night,

apply lanolin generously under and about nails and bandage loosely. Clean the nails with orange wood sticks. Cut the nails only in a good light and after a bath, when the feet are very clean. Cut the nails straight across to avoid injury to the toes. If you go to a chiropodist, tell him you have diabetes. (3) If the feet become too soft and tender rub once a day with spirit lotion. (4) Wear shoes of soft leather which fit and are not tight (neither narrow nor short). Wear new shoes one half hour only on the first day and increase one hour daily. Beware of nails and torn linings in old shoes. Socks should also fit well; they are best made of wool or wool and cotton mixed.

Treatment of Corns and Callosities. (1) Soak the foot in warm, not hot, soapy water. Rub off with gauze or file off dead skin on or about the corn. A corn may be painted with the following mixture: salicylic acid, 1 drachm; collodion, 1 oz. Repeat for four nights, then, after soaking in warm water, the corn will come off easily. If it does not come off easily without bleeding, repeat the treatment for four nights. (2) Do not cut corns or callosities. (3) Wear a pad to distribute pressure if necessary. Use felt instead of medicated corn plaster.

Circulatory Aids. (1) Exercises. Bend the foot down and up as far as it will go six times. Describe a circle to the left with the foot six times and then to the right. Repeat morning, noon and night. (2) If subject to chilblains wash feet daily in warm water, dry carefully and powder lightly with talci boricus (B.P.C.). Wear woollen stockings and avoid extremes of temperature. (3) Do not wear circular garters. (4) Massage with lanolin. (5) Buerger's passive exercises give excellent results for patients lying in bed, as does the violet ray for indolent sores. The exercises should not be used where there is extensive gangrene or the infection is recent or spreading.

The cycle begins with the patient laying on his back in bed; his legs are elevated on a board to an angle of about 45° until they are blanched, which takes from thirty seconds to three minutes. Then the patient sits up and hangs his legs over the side of the bed for one or two minutes after a distinct redness or flushing of the feet takes place. This proceeding may be painful and so have to be shortened; with open ulceration the pain may be relieved by suspending the feet in a basin of warm sterile saline. For the second half of the cycle the legs are placed in bed horizontally or a little below the horizontal to prevent ischaemia and they are kept warm by an electric cradle or electric pads. The average length of the cycle is ten minutes, made up of two, three or five minute periods and each seance comprises six cycles, and two or three seances may be carried out in the day. Active use of the feet by means of

walking should be carried out for a minute or two several times a day as soon as the infection has quieted down and healing has begun.

In "pavaex therapy" or passive vascular exercises the limb, enclosed air-tight in a glass case, is alternately subjected to negative (−120 mm. Hg.) and positive (+20 mm. Hg.) pressure so as to increase the circulation. In intermittent claudication the author has found considerable benefit to follow from carbon dioxide inhalations,[2] as originally described by Yandell Henderson.

Treatment of Abrasions of the Skin. (1) Insignificant injuries may have serious results and must be treated at once. Consult your doctor. (2) Avoid irritating antiseptics such as iodine and picric acid. (3) As soon as possible after injury certain surgeons recommend the application of sterile gauze saturated with spirit lotion. Keep wet for one hour by pouring on more lotion. Later keep wound covered with boric acid ointment on sterile gauze. Change daily until healed. (4) Elevate, and avoid using the foot as much as possible until recovery. (5) Consult your doctor for any redness, pain, swelling or other evidence of inflammation.

Glycosuria in Pregnancy.

The power to assimilate carbohydrate, as indicated by the "blood sugar tolerance curve", tends to increase in the latter part of pregnancy in a normal woman without glycosuria, presumably owing to the supply of foetal insulin, as the foetal pancreas develops; it falls after childbirth with the removal of the insulin and later reaches the original level. However, it remains within normal limits throughout. The renal threshold for sugar tends to be low;[3] this was found to be the case in six out of eleven cases.[4]

Glycosuria in pregnancy is not uncommon (5·4 per cent of 640 cases) and is usually not due to diabetes. The sugar tolerance test is important as a means of differentiation. In only four out of twenty-one non-diabetic cases was a lowered threshold (renal glycosuria) found to be responsible for the glycosuria. In seventeen cases the sugar tolerance curve was found to be higher than normal, approximating to the "Plateau" or "Lag" type of curve. This abnormal curve tended to rise as pregnancy advanced instead of falling as in the case of the normal pregnant woman. The excretion of sugar is rarely large and when there is but little lowering of the threshold, sugar may only be found after a carbohydrate containing meal. In about half the cases the glycosuria remained in the puerperium and the curve was still high.[3]

An abnormal sugar curve has been found to be of great significance in explaining cases of miscarriage of unknown origin; it was

present in 90 per cent of such cases, the average number of miscarriages being 3·2 in each case.[4] Such patients can be treated successfully by injections of corpus luteum extract.*

In all these conditions a special look-out should be kept for ketosis by performing Rothera's test on the urine. Ketosis is liable to occur during the pregnancy because of the foetal demand for insulin; and its presence, when not due to some obvious cause such as vomiting, requires treatment by increasing the carbohydrate content of the diet and if necessary using insulin when the sugar tolerance is low, especially if there is any infection such as pyelitis. In most cases it is sufficient to space the carbohydrate at equal and rather frequent intervals through the day. Thus six meals should be taken and 30 or 40 grm. of carbohydrate at each meal.

Lactosuria, which occurs after childbirth in about 5 per cent of cases, is due to absorption of the breast milk, especially when it is not being used to nourish the baby; it may be present during the last few months of pregnancy when the breasts contain much colostrum.

Diabetes in Pregnancy.

The unfavourable effect of diabetes on the reproductive function in women has long been known. Before the days of insulin menstruation was absent in 50 per cent of diabetics and disturbed in another 15 per cent. Not more than 5 per cent of diabetic women became pregnant. Whitbridge Williams found that the mortality during pregnancy, labour and in the puerperium was 27 per cent and that 50 per cent of the patients were dead within two years of their confinement. The outlook of the child was not much better; in 41 per cent of cases there was abortion or stillbirth often before full term. The prognosis was better when the diabetes first manifested itself during pregnancy—usually at about five or six months—than when pregnancy occurred in a woman already diabetic.[6]

The introduction of insulin has made all the difference in the outlook and pregnancy has now ceased to be a serious additional risk to a diabetic woman. In twenty-one pregnancies, collected by Walker in 1928, there was one maternal death but in this case there was present a severe " toxaemia of pregnancy " in addition.[7]

There is general agreement that in the early months of pregnancy in the diabetic woman the insulin requirement is increased and to this fact, no doubt, was partly due the high mortality of pregnancy in pre-insulin days. There is some doubt as to whether in the later months of pregnancy the insulin secreted by the foetal pancreas gains access to the maternal circulation and so if the mother has

* Personal communication from Mr. Frank Cook.

diabetes, lessens or even abolishes the maternal requirement of insulin by injection. Some cases have been described in which the foetal insulin appears to act in this way;[8, 9] but in the depancreatized dog treated with insulin Macleod found that there was no diminution in insulin requirement as pregnancy advanced. In severe cases of human diabetes loss of tolerance has been found about the sixth or seventh month. Tolerance is usually regained after labour and a look-out must be kept for hypoglycaemia.[5]

Lambie[6] has suggested an explanation of these opposing results. If the maternal blood sugar is high an extra quantity of dextrose will gain access to the foetal circulation and by stimulation there will be overgrowth of the foetal islands of Langerhans during the later months of pregnancy. Over twenty times the normal amount of island tissue has actually been observed—no doubt, a response to the increased functional demands made upon it. The increased production of foetal insulin may act in two ways; more sugar may be utilized by the foetus and some of the insulin may diffuse into the maternal circulation. Both of these actions will lessen the severity of the maternal diabetes towards the end of pregnancy. But if the mother is efficiently treated with insulin, as was the case in McLeod's experiments, then there will be no hyperglycaemia and no stimulation of the foetal pancreas and no lessening of the requirement of insulin.

While the outlook for the mother is so favourable the same could not at first be said about the baby and in only half of the pregnancies collected by Walker did the child survive when insulin was used; but in a new series of eighty cases when the diabetes was well controlled the mortality has been reduced to 16 per cent.[5] Apart from the danger of foetal death and miscarriage during pregnancy the extreme exertion of labour may be a factor; by the increased burning up of sugar the mother may become hypoglycaemic, which may react unfavourably on the child. Again if the islands of Langerhans are hypertrophied in the foetus foetal hypoglycaemia may occur spontaneously after its connection with the maternal tissue is interrupted; but the evidence that this occurs is uncertain.

Hydramnios (increase in the amount of amniotic fluid) is another complication when the maternal diabetes is imperfectly treated. Lambie's explanation holds good, if it is agreed that in the later months of pregnancy the amniotic fluid is at least partly made up of "foetal urine" secreted by the kidneys. The foetal hyperglycaemia will cause diuresis and the urine will contain sugar and, if the osmotic pressure from the sugar rises above that in the blood vessels of the amniotic membrane, further fluid will be drawn into the amniotic

sac until osmotic equilibrium is established. There may be as much as 12 litres of amniotic fluid. Labbé and Couvelaire[10] have observed that hydramnios took place in a pregnant diabetic, whenever she broke the rules and took too much food, and the excess of fluid subsided again in the interval. Excessive size of the foetus with excess of subcutaneous fat is another well-known complication, presumably due to the proliferation of the foetal islands and the increased storage of sugar; the general overgrowth may give rise to difficult labour.

From these considerations it will be evident that diabetes must be excessively rare in the new-born infant; but sugar may occasionally be present in the urine from the hyperglycaemia present just before birth. There appears to be a tendency for the children of diabetic mothers to show congenital abnormalities; hydrocephalus, meningocele, congenital heart disease, and monsters have been reported among other abnormalities.[5]

Treatment. As regards the mother the fact remains that the diabetes is more severe, at any rate in the early months of pregnancy, so that in spite of the favourable outlook it would not be reasonable to compel a diabetic woman to go to full term, if this was against her wishes; and, if the pregnancy were terminated by Caesarean section, it would be reasonable to sterilize the patient if this was desired. If a child is desired and the nutrition of the patient is satisfactory, a full pregnancy should be allowed if the patient is prepared to remain under medical supervision. If artificial termination of pregnancy is decided upon the method chosen should be the one least likely to expose the patient to the risks of infection. During pregnancy a liberal carbohydrate diet with insulin should be allowed, so as to keep the urine free from ketone bodies as well as sugar; but, as regards the latter, it must be remembered that the threshold for sugar is sometimes low.

As experience with insulin becomes more general the foetal death rate should be lessened. During labour each case should be treated on its merits: but the guiding principles will be to spare the insulin and to give plenty of dextrose by mouth, and to be guided by frequent examinations of the urine for sugar and ketone bodies. If the mother has been treated during pregnancy with a very strict diet the storage of glycogen will be small and it may be rapidly used up during the exertion of labour; and acute ketosis with onset of coma may result. This is another argument in favour of allowing plenty of sugar during labour. If the mother becomes comatose the chance of survival of the child is slight. The usual treatment for coma should be undertaken; it is dangerous to try and

empty the uterus. If the diabetes is severe, the mother had better not try to nurse her baby. This will only be advisable if the disease is well under control, and the mother retains her strength.

Some of these points are illustrated by the following case of four pregnancies in seven years. The patient was a lady who in September 1923 began insulin treatment when twenty-five years old, within a week of the discovery of her diabetes. In 1929 her sugar tolerance was tested; insulin had been omitted the evening before and her normal diet taken up to the time of the test. After 50 grm. of dextrose the blood sugar rose steadily from 0·18 per cent to 0·29 per cent. in one and a half hours; it was 0·23 per cent in three hours. Hence her diabetes was mild but genuine. In the first pregnancy the insulin requirement rose from about 20 units to 28 units a day at the fourth month on 100 grm. carbohydrate. Just before the baby was born 24 units were found to be too much and 22 units were advised. She took 26 units while she tried nursing the baby; but the nursing had to be given up after three weeks. The insulin requirement fell again to 20 units which were taken for the next ten months. The carbohydrate intake was then increased to 165 grm. and the insulin requirement fell in five months to 16 units when the second pregnancy began. 16 units were taken up to six months when the tests suddenly became bad and 24 units were required; this had to be decreased again in the last four to six weeks of the pregnancy. The requirement fell to 14 units six weeks after her second baby was born. The carbohydrate in the diet was then increased to 250 grm. which included some sugar, and 24 units were taken. At the seventh month of the third pregnancy the insulin requirement was 28 units and this dose was being taken when the baby was born one month prematurely, at about the time that on previous occasions she had found it necessary to reduce the insulin. The baby weighed 10 lb., and there was excess of liquor amnii which suggests that the insulin dosage was not sufficient on this occasion. The previous two babies weighed 7¼ and 8½ lb. She began the fourth pregnancy (February 1934) taking 26-8 units daily as well as 2 oz. of raw liver by mouth; the blood cholesterol had been found to be 176 mg. The insulin was increased to 34 units in three doses, her sugar tolerance again showed definite improvement at the time the baby was born, i.e. a month early, weighing 6¼ lb. The baby had left-sided microphthalmos and hydrocephalus has developed. Eight months later the patient was taking 24 units, also in three doses. She always has a low renal threshold but the blood sugar when tested has usually been normal, i.e. varying between 0·08 and 0·15 per cent according to the time of day, and the appearance of reactions has

been the only indication for reducing the dose of insulin. This case is interesting from several points of view. She may well be the only diabetic woman at present to have borne four living children while taking insulin. On each occasion the insulin requirement was increased during pregnancy; it had to be reduced a little in the last few weeks, indicating that the foetus may have provided a little insulin to the mother; but even so the requirement was much greater than soon after the birth of the child. The great increase in the carbohydrate intake has not meant a large addition to the insulin required. The history of the last two pregnancies suggests that the greatest care is necessary in balancing the diet and the insulin. In a case recently dealt with a woman of 30, who previously had an anencephalic monster weighing 13 lb. still-born, has had a healthy child after 5 months on a diet containing 230 grm. carbohydrate, 75 grm. fat (2,000 cals.), taking 50-60 units of insulin daily in four doses.

An important question to answer is, if one of the parents is diabetic what chance is there of children becoming diabetic? Undoubtedly diabetes is a hereditary disease and there will certainly be a chance of the children developing it; this chance will presumably be less if the diabetic parent has no relations who have diabetes. The chances do not appear to be any greater for the patient than for his brothers and sisters who are not sufferers from the disease (Joslin) and nobody would think of suggesting that they should not marry or have children. The question must be left at this point. The author's view is that the risk may well be taken where children are desired, because if diabetes develops the treatment is so satisfactory. Joslin suggests that the best birthday present that a child can be given is a yearly examination of his urine for sugar. This is the kind of present that should not be omitted in the case of children born of diabetic parents; they should keep in touch with their doctor. In no circumstances should two diabetic patients marry each other and have children.

[1] *Guy's Hosp. Reps*, 78, 294, 1928.
[2] *Diabetic Surgery*, Philadelphia, 1928.
[3] E. C. Pillman Williams and L. Wills, *Quart. J. Med*, 22, 493, 1929.
[4] E. C. Pillman Williams, *Lancet*, 2, 858, 1933.
[5] E. Skipper, *Quart. J. Med*, 2, 253, 1933.
[6] C. G. Lambie, *J Obstetr. and Gyn. B.E*, 83, 563, 1926
[7] A. Walker, *Proc. Roy Med. Soc*, 21, 377, 1928
[8] R. D. Lawrence, *Quart. J. Med.*, 22, 191, 1929.
[9] E. Parsons, L. M Randall and R. M. Wilder, *Med Clin. N. Amer.*, 10, 679, 1926
[10] M. Labbé and Convelaire, *Bull. de l'Acad. de Med.*, 94, 1016, 1925
[11] L. G Herrmann and M. R. Reid, *Annals of Surgery*, 100, 750, 1934.
[12] Argyll Campbell and E. P. Poulton, *Oxygen and Carbon Dioxide Therapy*, London, 1935, 104.

Chapter IV

DIET IN OBESITY

All patients with obesity eat more than their bodies can burn up and so the extra is laid on as fat. A reduction in food will in all cases lessen the body weight. In many cases of obesity the metabolism is high; this may be regarded as a "luxus consumption" brought about by the increased nutrition of the body which *stimulates the thyroid gland.*[1] *In these circumstances thyroid* should not be given because the tissues cannot act more vigorously than they are already acting; reliance alone should be placed on reducing the intake of food. In other cases the metabolism is not so high, though it may still be above the value for the subject before he became fat. The thyroid gland is active; but not so active as in the first group and its action on metabolism may well be helped by giving extra thyroid by the mouth. The standard thyroideum may be used or else the pure hormone, thyroxin, which may be given in doses beginning with 0·2 mg. and increasing up to a milligram or more daily. The results are satisfactory as far as the feelings of the patient are concerned; but in most cases a reduction of diet is also necessary to obtain a fall in weight.

Where there is evidence of pituitary deficiency, as in the disease dystrophia adiposo-genitalis, pituitary by mouth combined with thyroid has been found to be of value.

In many cases when the obesity is not excessive and there is no particular urgency it is not necessary to give a measured diet. There will be a loss of weight if the patient is told to exclude fat from the diet, i.e. butter, cream, cream cheese and fat meat and bacon. He will be allowed to eat lean meat, chicken, white fish boiled, steamed or grilled, Dutch cheese or cottage cheese preferably made with skim milk, bread, plain biscuits, potatoes and plenty of other vegetables which are bulky and fruit including fresh fruit; a few ounces of milk are allowed with tea; jam, honey and marmalade may be taken in small amounts. Appetite is curbed, if he is told to drink either before or after, but not during the meal. Vitamin D and possibly Vitamin A will be deficient on such a diet; but the body fat must contain plenty and their administration in the form of a teaspoonful or so of cod liver or halibut liver oil, a few drops of radiostoleum or adexolin or other proprietary preparation will only be necessary when the patient has already lost weight. Such a diet may be surprising to those who have been brought up on

principles handed down from the days of the Banting and Salisbury diets—the insistence on a high protein and low carbohydrate diet, and especially the avoidance of potatoes. And yet potatoes are bulky foods of rather low Calorie value, while the Calorie value of fats is high. A device that may be effective in lessening the amount of food taken is to order either carbohydrate or protein foods at a meal and not to give the two at the same meal.

Some obese people take a great deal of salt with meals. On cutting this down diuresis follows and weight is lost. To achieve this it may only be necessary to ask them not to take added salt at their meals.

If a weighed diet is required, the 800 Calorie diets P, Q, R are given as examples (see Appendix). The carbohydrate is usually high enough to provide bulk. It may be necessary to take as low a diet as 600 Calories; in such a diet agar agar jellies of no food value may be useful (see Table 8). It is safer to avoid any prolonged drastic reduction in the case of elderly people with arterial disease. Complete fasting is unpleasant and not effective unless the subsequent diet is kept low; but periods of a week or fortnight may be tried with a diet of fresh fruit and every other day one protein meal to provide for the loss of protein; this would consist of lean meat, chicken or white fish. Alcoholic beverages are best avoided; but if taken their Calorie value must be reckoned with. In other cases a diet of 1,200 to 1,600 Calories as in Diets C, E, F, H will bring about a lessening in weight.

In all cases the unpleasantness of a low diet can be much relieved by tablets of glucose or barley sugar which are carried about on the person and taken when there are feelings of emptiness. In cases of cardio-vascular disease cane sugar or glucose may be given four or five times a day in doses of ½ to 1 oz. in lemonade or orangeade to provide for the nutrition of this system; the Calorie value of the remainder of the diet is kept low; diet S is an example.

Other methods of weight reduction include exercise, of which walking is the best, tepid or cold baths, with vigorous rubbing of the skin afterwards, sweating as in the Turkish bath and for those who cannot walk the Bergonié method of stimulating the muscles to contract by electrical means; though it is not very effective in increasing metabolism this method is better than taking no exercise at all.

Physical Treatment.

Miss H. S. Angove, until recently Sister-in-Charge of the Department for Massage and Remedial Exercises at Guy's Hospital,

has kindly supplied the following scheme of treatment carried out in this department. It consists of progressive muscular work and "petrissage" (squeezing and relaxing) of the fat masses covering the individual groups of muscles. To avoid bruising of the tissues, the depth of the manipulating must be graduated. The work is designed to bring into action all the skeletal muscles of the subject, increasing the range of movement of joints and improving the posture of the body. Treatment by the Gymnast should be given three times a week, and a scheme of free exercises should be carried out night and morning at home. A "foam" bath may safely be given by the Gymnast twice a week before the exercises. To guard against too strenuous progress a pulse chart should be kept.

Work administered by the Medical Gymnast.

All garments which restrict movement are removed. The resting pulse is taken.

Exercises to be repeated ten to twenty times.

1. Lying on the back with knees bent. Breathing; (*a*) inspiring and expiring, moving the chest wall to its maximum; (*b*) inspiring, using the diaphragm, holding, and strongly retracting the abdominal muscles; (*c*) inspiring and retracting the abdominal wall simultaneously.

2. Sitting. "Petrissage" of fat masses on neck and shoulders; followed by raising and lowering the shoulders; extending and flexing the head; rotating the head.

3. Lying on back with knees bent. Rotate forwards and lower pelvis; raise and lower head and shoulders; retract and relax abdominal muscles, followed by deep abdominal breathing.

4. Lying prone. With knees extended raise and lower the legs alternately; tighten and relax the gluteal muscles; raise and lower both legs together.

5. (*a*) Lying on back with knees bent. "Petrissage" of fat masses in abdominal wall. (*b*) Sitting. Turn trunk from side to side.

6. Standing with feet apart. Quickly bend trunk forwards and downwards with knees straight; return to vertical position.

7. Sitting. Breathing as in Exercise No. 1.

Exercises for use at home, to be repeated from ten to twenty times:—

1. See Exercise 1.

2. Sitting. Extend and flex knees, first alternately and then both together.

3. Sitting, with arms down at the sides: (*a*) Quickly flex both elbows; extend limbs above head, flex and return to sides.

(*b*) With elbows extended; quickly abduct limbs and swing them in a circle to above head; return to sides.

4. See Exercise 3 above.

5. (*a*) Standing with feet apart, rotate pelvis and trunk from side to side. (*b*) See Exercise 5 (*b*) above.

6. See Exercise 6, above.

7. Sitting. Double arm circling as in 3 (*b*), inspiring with ascent of arms, expiring with their descent.

Nephritis.

When nephritis is associated with obesity and there is danger of uraemia, the cause of the nephritis may well be sepsis in the urinary tract or malignant hypertension; the case will hardly be one of chronic Bright's disease (small white kidney), since the latter tends to cause under-nutrition. But acute nephritis or subacute glomerulo-tubular nephritis (hydraemic nephritis) or nephrosis may well be met with. The treatment of the nephritis may often be more important than the treatment of the obesity.

Apart from prescribing a diet below the normal Calorie value, which will be desirable for the obesity, there are certain factors to be taken into consideration. The protein should be low when there is deficiency in the excretory function; but enough must be given to cover the protein loss, as indicated by the amount of urea or total nitrogen in the urine and also the albuminuria. M is such a diet of 1,200 Calories and Q another of 800 Calories. Purines, the excretion of which must tax the kidney, should also be on the low side, as in diet O of 1,200 Calories, and this is of special importance in gout and arteriosclerosis, when excess protein and salt should be avoided. The diet should be alkaline rather than acid; this may be obtained partly by replacing the bread and cereals of the above diets by potatoes (which, however, will increase the intake of oxalates) and partly by increasing the vegetables and fruit or by using the lacto-vegetarian diets T or U. Epstein's diet for nephrosis, which is intended to stimulate diuresis, contains excess of protein and little fat; K is such a diet of 1,600 Calories in which the salt content has also been reduced. The propriety of giving an excess of protein may be doubted where the kidney is inflamed and on this view the plasmon in Diet K would be replaced by carbohydrate, especially in the form of fruit, vegetables, honey, jam and marmalade. A and D vitamins would be added. P is a rather similar diet of 800 Calories. The content of salt should be low especially if there is oedema (see page 56).

[1] T. W. Adams and E. P. Poulton, *Guy's Hosp. Reps.*, 85, 447, 1935.

Chapter V

SOME ORGANIC CONSTITUENTS OF FOOD

Vitamins.

Vitamins or accessory food substances are necessary for health and although sufficient of them will ordinarily be present in a mixed diet of families who are in good circumstances, this will by no means be the case when the economic conditions are unfavourable, or when for medical reasons a special diet is ordered, while epidemics of beriberi, pellagra and rickets show that there is no appetite inherent in man for vitamin containing foods.

Vitamin A, which is soluble in fats and not destroyed by heat though readily oxidized, is necessary for normal growth; without it there may occur xerophthalmia, a type of conjunctivitis, with hemeralopia or night blindness. There is the possibility that when the vitamin is deficient the body may be liable to various infections such as puerperal septicaemia, broncho-pneumonia, middle-ear disease and sepsis of the nasal sinuses, while in animals disease of the central nervous system has been observed. It helps the growth of the soft tissues round the teeth. The fat-soluble yellow colouring matter of plants, known as carotene, is closely related to vitamin A and is converted into it in the body; vitamin A is largely stored in the liver. Green vegetables are very rich in vitamin A; the green outer leaves containing more than the white interior. Spinach, cabbage, lettuce, Brussels sprouts, green peas, Globe artichoke, watercress, asparagus, are to be specially mentioned. Carrots and sweet potatoes contain plenty; but other roots contain little or none. The vitamin is scarcely destroyed on cooking vegetables, even after the addition of soda; 4 oz. cooked carrots contain about the same amount as a pint of milk.[1] Cereals are rather poor in this vitamin apart from yellow maize. Nuts are rather poor apart from almonds. The tomato, banana and date contain as much as green vegetables, while apples, figs, oranges, lemons, grapefruit, pineapple and peaches contain small though appreciable amounts. The tropical fruit, the paw-paw, is rich and the mango contains as much as is in butter. All fresh flesh foods and organs so far as they contain fat, are sources of the vitamin; but liver is particularly rich, while bacon and ham, as preserved foods, contain but little of it. Halibut liver oil is the richest source known, containing

30,000-360,000 units per grm.[1] and then comes cod liver oil containing 600-4,000 units per grm. In the ordinary way vitamin A is best taken in the form of fresh green vegetables, carrots, milk and butter. Commercially it is sold as *avoleum*.

Vitamin B is water-soluble and is really a group of vitamins of which the first two are of clinical importance. B1 is antineuritic, i.e. anti-beriberi. B2 may prevent pellagra. It is possible that lack of vitamin B may be responsible for atony of the intestines and anaemia. The most important source of B is the cereals; but it is present mostly in the germ, to a lesser extent in the bran or outer covering of the seed and is absent from the endosperm which consists of pure starch. It is completely removed from rice by steam milling, which yields the endosperm in the form of polished rice. Since the latter has been the staple diet of certain peoples, their liability to beriberi is explained. The vitamin is also absent from white flour; but, as yeast, the richest source of B known, is added in order to make bread, white bread will still contain a little though possibly not a significant amount; but the popularity in medical circles of brown or wholemeal bread depends on the inclusion in the flour of much of the outer covering of the grain which contains B1. The pulses—beans, lentils, dried peas—are rich in the vitamin; it occurs in nuts and green vegetables and to a smaller extent in fruit. Egg yolk and animal organs contain large amounts; but meat is comparatively deficient. Milk is poor in the vitamin.

In the course of tissue oxidation in the normal brain pyruvic acid is formed and this is at once removed under the influence of Vitamin B1; when this vitamin is deficient, pyruvate accumulates in the brain[4] and has been found in excess in the blood of beriberi patients. Dr. C. C. Ungley (personal communication) has observed in this country a polyneuritis in three patients with gastro-intestinal disease, such as pyloric stenosis; a deficient intake and absorption of Vitamin B, appears to be the cause. There will be more knowledge on this subject, when there has been perfected a method of estimating this vitamin in the blood.

B2 which prevents the dermatitis of pellagra—though there is some doubt about this at present—is usually accompanied by B1 in ordinary food-stuffs, though these amounts do not always run parallel. Thus there is more of it in meat and milk and less in egg yolk and green vegetables. B2 is more stable than B1 when heated. The temperature necessary for canning vegetables affects B1 though cooking in boiling water is pretty safe. However, the vitamins are apt to escape into the water and so become lost. Dried vegetables and fruit may contain considerable quantities of the B vitamins.

Vitamin C—which is water-soluble prevents scurvy; it has now been prepared in the pure form as ascorbic acid. Paprika is its richest source. There is no vitamin C in cereals, except when they are germinating. Green vegetables, tomatoes and rhubarb contain abundant supplies in the fresh state, particularly cabbage and watercress. The juice from swedes is very rich; but other roots are poor in the vitamin, while potatoes occupy a mean position. Dried vegetables contain none. Orange, lemon and grapefruit juice are very active in anti-scorbutic power, while ordinary preserved lime juice is inactive. Tablets of dried lemon juice made up with sugar and gum tragacanth retain their activity for twelve months if kept cool. Apples vary in their activity, Bramley's Seedling, Belle de Boskoop and Blenheim Orange being the best. Many common fruits such as grapes, cherries, plums and peaches are poor in the vitamin, while "berries"—strawberries etc., are moderately rich. Milk and meat are poorest in the vitamin, while eggs contain none at all.

Vitamin C, though heat stable, is very sensitive to oxidation by air especially in alkaline solution and to preserve it soda should not be added to vegetables when they are being cooked. Slow cooking of vegetables in stews is very deleterious to it and outbreaks of scurvy have resulted from this. The meat should be stewed alone and the vegetables cooked separately as quickly as possible and subsequently added to the stew.

Many patients in hospital excrete in the urine less than 10 mg. ascorbic daily. In the case of students and laboratory workers taking a little fruit the values are usually between 10 and 20 mg. a day as determined in the laboratory of Clinical Chemistry at Guy's Hospital under the direction of Dr. J. H. Ryffel.

To exclude the possibility of Vitamin C deficiency it has been suggested that the criterion should be not the amount excreted, but the degree of saturation of the body with the vitamin.[5] Dr. Graham determines this by giving 1,000 mg. pure ascorbic acid daily until 75 per cent. of the amount is excreted in the urine when full saturation is obtained; the test can be repeated at intervals. There is the possibility, though it has not been proved, that healing, e.g. of a peptic ulcer, takes place more readily when there is plenty of Vitamin C available. 2 ozs. of lemon or orange juice are equivalent to 30-36 mg. ascorbic acid, and this is the simplest way of administering it in the ordinary way.

Vitamin D is fat-soluble and is associated with vitamin A; its stability to heat varies. It prevents rickets and osteomalacia and defects of calcification in the teeth and surrounding bony alveoli.

It has been prepared in the pure form as calciferol from ergosterol which has been irradiated with ultra-violet light. Fresh green vegetables, such as salads, if they have been exposed to sunlight, contain appreciable amounts of the vitamin immediately after cutting; but this probably has wholly disappeared by the time they are bought in retail shops. Fish liver oils—cod liver oil, halibut liver oil, puffer fish and shark liver oil—are the richest source of the vitamin and may contain 500 times as much as butter and milk. But owing to the high content of calcium in milk the latter forms a much more active anti-rachitic agent than would correspond to this figure. The vitamin content of butter and milk varies with the sunlight to which the cow is exposed and the vitamin content of the animal's food. Margarine which is made chiefly from vegetable fats, especially coconut oil, would contain practically no vitamins; but A and D are added to the more expensive brands during manufacture. Animal livers contain much less than fish livers; egg yolk is rich in the vitamin. The vitamin D content of most common foods is low in contrast with vitamin A[1]; if additional amounts are required they are best taken in the form of cod liver oil containing 60-300 units per gram, or halibut liver oil containing 2,000-4,000 units per gram. It is sold as *radiostol* and mixed with vitamin A as *radiostoleum* or *adexolin*. Vitamin D is synthesized in the human skin under the influence of sunlight; hence the advantage of sunbathing for rickety children, though sunlight is often abused by quite healthy people.

Vitamin E is fat-soluble; it has been found to be necessary for reproduction in the rat and mouse. There is so far but little evidence of its importance in man. Its richest source is the green leaves and embryos of seeds; but it is present in small amounts in meat and subcutaneous fat, milk and butter.

For further information on vitamins reference should be made to the special report on "Vitamins—a survey of present knowledge",[2] published by the Medical Research Council in 1932. In particular the book contains lists of foods with the relative amounts of vitamins in each, with a complete reference to the literature up to that date.

Vitamins in Childhood. A good supply of vitamins is more necessary in infancy and childhood than at any other age. This may be insured (*a*) by breast feeding up to eight or nine months, provided the mother takes plenty of dairy products and vegetables; (*b*) by giving a supplementary supply of vitamins; this will be particularly necessary after weaning at the normal time or if artificial feeding is resorted to. Proprietary foods, consisting of cereals, are

often given and the child apparently thrives, becoming fat and putting on weight. But with cereals the requirement of vitamin D is greater than without them and there is a tendency to rickets. "Fat rickets" was described clinically long before vitamins were heard of. Vitamins A and D can be supplied by giving a teaspoonful of cod liver oil daily to an infant of three months and two teaspoonfuls from five months onwards. There are proprietary preparations such as radiostoleum and adexolin, which contain A and D. Egg yolk, half to one daily, will supply vitamins A, B and D. Orange, lemon, tomato and swede juice—two or more spoonfuls daily will supply vitamin C. Swede juice from grated, uncooked swede is extremely rich; but not very palatable. The B complex may be obtained in the form of yeast extract or Marmite and there is the proprietary Bemax made from wheat germ. Purées of spinach, carrot, turnip, cabbage, potato and swede, which will contain varying amounts of vitamin A, B1, B2 and C may also be given. The advisability of giving wholemeal and brown bread has often been urged; but most children as well as adults find white bread more palatable and even, though in the latter the content of the B vitamin is much less, there is no reason to suppose that an ordinary mixed diet will not supply a sufficiency.

Purines.

A low purine diet is used in gout where there is a difficulty in metabolizing and excreting uric acid which thus accumulates in the blood. Foods containing oxalates in quantities should also probably be excluded, as synthesis of uric acid from oxalates is a possibility. Evidence has also recently been brought forward that a diet with plenty of fat may bring on an attack of gout (see later). A low purine diet certainly does good in some cases of high blood pressure, relieving symptoms; but without much, if any, fall of blood pressure. The low protein diet for azotaemic nephritis will also in most cases be a low purine diet. Oxalate containing foods should be avoided in oxaluria; in the case of a medical student with oxaluria under the care of the author, relief from a persistent pain in the right groin was obtained by means of a low purine low protein diet and this type of diet was repeated on occasions in subsequent years.

Purine bodies occur in the nuclei of cells, so that in proportion as these are excluded, the lower the purine content of the diet will be. An egg contains only 5 mg. of purine nitrogen while the portion of caviare ½ FR, consisting of a number of small eggs, does not contain much more, viz. 11 mg. These figures are low because unfertilized

eggs contain but one nucleus each, the germ of the egg. Most other foods contain purines in variable amount. Thus of the foods most commonly eaten 200 c.cm. or 7 oz. of milk contains 2·8 mg. of purine nitrogen, 1 CR—38 grm. white bread contains 3 mg.; 47 grm. wholemeal bread 7 mg.; 115 grm. potatoes 6·4 mg.; ½ CR—177 grm. strawberries 9 mg. These figures are in contrast to the following: 100 grm. coffee contains 360 mg. purine nitrogen in the form of caffeine and tea 800 mg. A cup of coffee contains 23 mg. Cocoa, too, contains very large amounts of purine nitrogen—590 mg. per cent and chocolate 193 mg. per cent—both in the form of theobromine; a cup of cocoa contains 54 mg. In Table F foods are arranged according to their purine content. The actual figures can be obtained from McCance and Shipp's analyses* and from H. Schall's *Nahrungsmitteltabelle.** If a strict low purine diet is prescribed the patient should confine himself to section (*a*), where the purine content of all the foods is less than 10 mg. per cent; but it will not make a great addition, if he chooses once or even twice a day articles from section (*b*), where the purine content rises as high as 20 (or 23) mg. per cent or per FR or ½ FR of food, as given in Tables 3 and 4. These amounts should not be transgressed. Section (*c*) should be avoided altogether.

Table F also contains the content of oxalic acid in foods, expressed in mg. per cent. Not many analyses are available; but there are some surprises. Potatoes have long been suspect as a food in gout. It is possible that the high oxalate content of 40 is responsible. Quite large amounts are also present in broad beans (? other beans), lettuce, beetroot (? other roots), chocolate, while enormous amounts are present in rhubarb, dried figs, spinach and sorrel, and cocoa has the highest percentage of all. With these articles in mind it will be easy to construct a table so as to avoid the kind of food that is likely to contain large amounts, i.e. pulses, roots, plums and allied fruits had better be avoided.

Apart from foods mentioned above the most recent work points to a low carbohydrate high fat diet as raising the uric acid in the blood, which is deleterious in gout.[3] It has been known for some time that the amount of uric acid excreted in the urine is diminished on such a diet; the reason now appears to be that it accumulates in the blood because the kidneys do not excrete it. Hence a high carbohydrate low fat diet would be suitable, at the same time avoiding high purine and oxalate containing foods and, as gouty people are apt to be too fat, a moderately low Calorie diet would also usually be advisable. Diet Q fulfils these requisites.

* Preface.

NEW VALUES FOR THE OXALIC ACID CONTENT OF FRESH VEGETABLE FOODSTUFFS

(Grm. per cent.)*

LEAVES AND STALKS	
Sorrel (Oxalis), leaves ..	2·263
	1·772
,, stalks ..	1·447
Tea	1·386
Spinach	0·837
Sorrel (Rumex acetosa) ..	0·836
Rhubarb, stalks	0·409
	0·511
	0·396
Parsley	0·239
Dill	0·139
Cabbage, white	0·010
Cabbage, green; Cauliflower; Brussels Sprouts; Lettuce; Asparagus	0
BERRIES AND FRUITS	
Cocoa powder	0·645
Red Currants	0·072
Black Currants	0·066
Bilberries, dried	0·044
Coffee, roasted	0·043
Raspberries	0·042
Broad Beans	0·039
Green Peas	0·036
BERRIES AND FRUITS (*continued*).	
Lemons	0·033
Oranges	0·028
Gooseberries	0·027
Strawberries	0·020
Tomatoes, green	0·018
,, ripe	0
Pumpkin	0·007
Cherries; Whortleberries; Plums; Cucumber; Apples; Pears	0
ROOTS	
Potatoes, unpeeled, "pink" ..	†0·058
,, peeled, "pink" ..	†0·036
,, ,, white ..	0·020
Spring Onions	0·055
Parsnips	0·039
Carrots	0·016
Beetroot	0·013
Jerusalem Artichokes; Radishes; Mushrooms ..	0
CEREALS	
Wheat Flour, Graham (brown)	0·060
Wheat Flour; Rye	0

* E. M. P. Widmark & Gösta Ahldin, *Bioch. Zeitschr.*, 265, 241, 1933.

† ? King, Edwards.

[To face page 54

§ H. E. Archer and G. Graham, 1918., [illegible]

Chapter VI

MINERALS, ACIDS AND BASES[1]

Sodium, Chlorine.

One of the main functions of sodium chloride is to preserve the osmotic equilibrium of the blood and tissues. In oedema, especially in nephritis, the sodium chloride of the oedema fluid is high as the protein content is low; salt in the diet of hydraemic nephritis will increase the oedema and the body weight and simultaneously diminish the flow of urine. The sodium chloride of the plasma is usually low in this condition, because very little salt is eaten and the oedema fluid accommodates so much of it; in nephritis without oedema the plasma and tissue chloride are often high "rétention séche", because the excretory power for sodium is deficient and plenty of salt is commonly taken. An explanation that accords with experiment is as follows: In *hydraemic* nephritis owing to obstruction in the tubules the passage of the glomerular filtrate is so slow that reabsorption of salt (primarily sodium) and water is increased. In *azotaemic* nephritis the tubular epithelium is so degenerated that reabsorption is impaired, but more so for water than for salt. The excretory function of the tubular epithelium is similarly impaired and so there is retention of nitrogen, sulphur and phosphorus in the blood. There is both salt and fluid retention in some cases of obesity when excess of salt is taken with the food.

The plasma chloride forms the hydrochloric acid of the gastric juice, the rate of secretion depending on the amount of carbon dioxide in the plasma.[2] Sodium in the form of bicarbonate is a buffer system which damps down the changes of acidity (hydrogen ion concentration) in the plasma and so tends to preserve its constancy.

An acute loss of chloride takes place when there is profuse sweating as in the case of miners and stokers; the result is miners' cramp, which can be prevented and treated, by drinking weak saline solutions; and salted foods—red herrings and beer—are highly popular with such hard workers. A chronic deficiency of sodium chloride with low plasma chloride leads to muscular weakness and fatigue as in Addison's disease; the blood becomes viscous from

increase of plasma proteins and polycythaemia associated with polyuria and there is increase in the serum potassium and blood urea. These blood changes (not the high potassium) with muscular weakness, fatigue and painful cramps have been observed in man when salt has been purposely excluded from the diet (McCance). However in Addison's disease the kidneys excrete sodium chloride, even though the plasma chloride is low, and great improvement follows the administration of 10 grm. of salt daily. In other conditions, where there is deficiency of chloride, for instance, in pneumonia, the body keeps fast hold of what salt it can and very little is excreted in the urine. Repeated vomiting is an important cause of chloride loss; this is commonly due to pyloric stenosis, hysteria, pernicious vomiting of pregnancy or acute gastro-enteritis particularly in children. There is alkalaemia and yet the urine is acid, because the kidney cannot excrete alkali when chloride is deficient (McCance); the indication is to administer isotonic saline intravenously or into the subcutaneous tissue or peritoneum. In gastrocolic fistula chloride is lost *per anum*.

The daily output of salt on a mixed diet is up to 5 grm. sodium and 10 grm. chlorine and the amounts in serum are 355 (Na) and in plasma 353 (Cl) mg. per cent.

McCance and Shipp* have shown that in flesh food the loss of salt during cooking, which is considerable, is due to loss of fluid which escapes from the meat (for all foods lose weight on cooking), and also to diffusion outwards (leaching) when the meat is cooked in water. It might have been thought that stewing and boiling would get rid of more salt than roasting, and this was certainly the case with beef steak when stewed for four hours; but with leg of mutton the losses were about equal, the volume of water for stewing and the length of time of cooking being all important; thus the loss of chloride was very small when beef steak was lightly fried.

In a poor salt diet which will be used in oedema and sometimes in obesity all salted foods, organs, crustacea and shell fish, duck, goose, turkey and game must be excluded; fresh fish should be steamed or boiled, when the salt will be reduced to about 0·1-0·2 per cent, and not fried since frying prevents much loss of salt; fresh meat should be boiled or stewed in plenty of water and roasting should be prolonged. All these flesh foods with eggs (containing 0·28 per cent of salt), milk (0·155 per cent) should be taken in strict moderation. Salt-free bread, butter, cream, honey, jam and marmalade may be taken as required. All fresh and dried fruit may be taken, except dried figs, which contain over 200 mg. of salt; and

* See Preface.

fresh vegetables except celery, spinach, sorrel and sauerkraut. Cooked celery is allowed, as it loses about half its salt on boiling. Tinned or preserved vegetables, e.g. olives, tinned peas, and baked beans contain much salt. Mushrooms are allowed. Most of the forbidden foods mentioned above contain over 200 mg. per cent of salt. Olive oil and gelatine contain much chlorine and salt may have been added to the dry cereals, such as oatmeal and sago. If symptoms of salt deficiency appear, as described above or are suspected, blood should be taken from a vein without loss of CO_2 and the chloride in the serum or plasma should be estimated. Then if deficient, more salt should be added to the diet.

Potassium.

Potassium is of importance in muscular contraction as an intracellular ion; the potassium of the serum is often increased in renal insufficiency and Addison's disease. Potassium has a greater diuretic effect than sodium. The average daily output is up to 4 grm. While potassium is present in serum in much smaller quantities than sodium, viz. 19·5 mg. per cent, it is considerably more abundant in nearly all cooked fresh foods, i.e. in cooked fresh fish, meat, poultry, game and organs; but this is not the case with crab, lobster, oysters and winkles and kidney as eaten. Vegetables, fruit (especially dried fruit) and nuts contain plenty; much is lost on boiling, particularly in the case of beans (butter and haricot). It is abundant in cocoa. As the atomic weight of potassium—39—is higher than that of sodium—23, some increase of potassium might have been expected; but the amounts are far in excess of this proportion. Hence it is that extra salt is taken as a condiment with food to preserve a just balance.

Calcium.

Calcium is important for muscular contraction and bone and tooth formation, for the coagulation of the blood and for lactation. Calcium exists in the body as calcium phosphate and carbonate in bones and other calcareous tissues, in the blood serum it is free as ionic calcium and also loosely combined with protein, so when the latter falls, as in nephritis, the serum calcium is also low. The ionic calcium, as calcium phosphate and carbonate, is probably held in super-saturated solution; if the phosphate ion rises the ionic calcium falls and vice versa (*see* Phosphorus).

When there is a deficiency, the bone formation is poor (osteoporosis), while rickets and dental caries become more pronounced;

deficiency of calcium is apt to occur when mineral acids are taken in the removal of lead from the bones in chronic lead poisoning and when calcium is mobilized from the bones by excessive parathyroid secretion, as in tumour of the parathyroid glands. In exophthalmic goitre there is marked loss of calcium, though the blood calcium is normal or lower than normal. When the serum calcium and cerebrospinal calcium fall, there is tetany and chorea is also associated with a low cerebrospinal calcium. If vitamin D is given in excess, calcification may take place in the arteries and calculi may form in the kidneys. The average excretion of calcium is 0·45 grm. daily and in serum there is 9·5 mg. per cent.

The presence of calcium in flesh foods, fruit, vegetables and nuts is variable.* Milk, skim milk, milk products and cheese are important sources of calcium and the same applies to all fish when the bones are eaten. Large amounts are present in boiled spinach (595 mg. per cent), dried figs (284) and rhubarb (103), probably associated with their high oxalic acid content (see p. 55). Other foods with over 100 mg. are almonds (246), Barcelona and Brazil nuts, lemons, Spring onions, watercress and boiled broccoli tops. Hard tap water contains plenty.

Magnesium.

Magnesium takes part in the ionic balance in the tissues between sodium, potassium and calcium; but very little is known about it in pathology. The amount excreted is 0·16 grm. daily and there is 3·2 mg. per cent in the blood serum. It is very widespread in food-stuffs; but whelks, winkles, tea, coffee, cocoa beans, almonds, Barcelona and Brazil nuts, pea-nuts and walnuts contain large amounts; it is the essential mineral of the chlorophyll molecule. It has been used in large doses to combat the convulsions of acute uraemia and tetanus; experimentally a diet free from magnesium causes degenerative lesions in the liver and kidneys of rats.

Manganese, Copper, Iron.

Manganese which is present in chocolate, bananas, beans, peas, leafy vegetables and whole grains is probably essential in minute amounts for normal growth and helps tissue respiration. It acts like copper in the formation of haemoglobin from iron; but is not so efficient. Manganese poisoning, a rare industrial disease, causes the symptoms of Parkinsonism.

Copper which is present in poultry, meat and organs (especially liver), in crustacea and other sea animals, vegetables, fruit, nuts,†

* See in preface references to McCance and collaborators, [6, 10].

† Barcelona nuts (0·96 mg. per cent) and Brazil nuts (1·1) contain much copper.

mushrooms and whole grains is probably essential in minute quantities for the metabolism of iron in the formation of haemoglobin. It is widespread in the body and 2 mg. a day are required for adults or about an eighth of the body's daily requirement of iron.[3] Most medicinal preparations of iron contain small amounts.

Iron[4] is the essential mineral in the haemoglobin molecule, which is the great respiratory pigment; it is also present in cytochrome and other respiratory ferments. It is present in all cells and the fact that it is freely absorbed over weeks when administered in large quantities[5] suggests that it may be stored away in the body in a masked form. In haemochromatosis enormous amounts of iron appear in simple form in the tissues. Iron can only be absorbed when in simple form and not when combined in complex organic molecules, so that only half of the iron of the food is available and this must first be reduced to the " ferrous " state. The hydrochloric acid of the gastric juice is concerned in this process and the stomach and duodenum are the site of assimilation; haemoglobin is then elaborated in the nuclei of the erythroblasts which are subsequently extruded from the cells.

It is reckoned that an adult's daily requirement of iron is 15 mg. Deficiency gives rise to " secondary " anaemia, where the haemoglobin of the blood is low and the red cells small, so that their number per c.mm. of blood is not necessarily reduced. The factors that tend towards iron deficiency and anaemia are achlorhydria; gastrectomy and gastro-enterostomy which may interfere with the site of assimilation; increased requirement of iron as during pregnancy which requires an extra storage of 3·2 mg. daily; menstruation where 50 mg. may be lost during the period, or 200 mg. with menorrhagia; lactation which requires 1·5 mg. daily; an alkaline diet which may increase the excretion of iron.

Iron is present in large quantities in cooked red meat, in beef varying between 5 and 9 mg. per cent; in game the percentage is 8 mg. and dark coloured organs 5·8 mg. Curiously enough, roast pigeon gave the highest value—19·4 mg., while stewed hare, whole animal—10·8—and boiled leg of mutton—10·4—came next. There is not much in white meat and organs, i.e. chicken (2·1), rabbit (1·9), pork (1·7-2·9), brains (2·1), sweetbread (1·6), tripe (1·6). Cooked white fish is poor in iron; but when fried with batter and crumbs its content, 1-2 mg. per cent, is more than when steamed—under 1 mg. per cent; the iron gets in during the frying presumably from the iron utensils employed. Small fried fish (sardines, smelts, sprats, whitebait) contain quite large amounts—3·3-5·1 mg. per

cent. Crustacea are poor in iron (1 mg.); but shell fish, especially cockles, mussels, winkles contain large amounts (15-26 mg. per cent); uncooked oysters contain 6 mg.* All these percentages are for the edible part prepared for table. Although the mineral in chlorophyll is magnesium, there is usually plenty of iron round the chloroplast. Much iron and magnesium escape into the water on boiling. Milk, eggs, white bread are poor in iron; but there is plenty in brown bread. This account indicates those foods most *worth while taking to prevent or treat anaemia due to iron deficiency*, always remembering that not more than half the iron in the food will be available. This may be supplemented by iron salts given by mouth, and ferrous salts which are most readily absorbed are best; such as Pil. ferri (Blaud's pill), containing ferrous sulphate, which should be freshly made up and crushed into a powder—15 grains or more three times a day; or as a mixture containing ferrous chloride gr. 3, syrup minims 15, chloroform water to 1 drachm which may be added to a little milk, or as the various iron containing mineral waters which must be taken fresh at the spring. When there is an accompanying achlorhydria, ferrous sulphate gr. 5, ac hydrochlor. dil. 1 drachm, water to 4 oz. may be sipped with meals. Liq. ferri perchlor. (minims 5-15) is very irritating, unless taken in milk.

There is a large enough store of iron in the new-born infant to last through the normal period of lactation; but later iron containing foods must be given. Diets with an average of 11 mg. of iron daily, as observed in Aberdeen, are insufficient to prevent anaemia in women who have begun menstruating. It is reckoned that an adult's daily requirement is 15 mg., as stated above.

Iodine.

Iodine is a constituent of thyroxin which is secreted by the thyroid gland and which increases the amount of combustion that is taking place in the body during rest (basal metabolism). When the thyroid is actively secreting, thyroxin is liberated into the circulation causing hyperthyroidism and there is little left in the gland; when the thyroid is quiescent, there are large amounts of iodine in the vesicles of the gland mixed with colloid and but little thyroxin is liberated. Deficiency of iodine leads to this quiescent

* Vegetables, fruit and nuts usually contain rather less iron. Naturally the highest values are found in dried fruits (peaches, 6·75 mg. per cent); of the fresh fruits the "berries" and currants contain most (about 1 mg.). Almonds, Barcelona and Brazil nuts, coconuts, pea-nuts and walnuts are rich (2-4·2). Of vegetables eaten uncooked the richest are endive, horseradish, mustard and cress (2-4·5), and of cooked vegetables, baked and *haricot* beans, leeks, lentils, turnip tops and spinach (2-4).

condition and the enlarged gland forms a goitre, which may be accompanied by symptoms of hypothyroidism—myxoedema in adults, cretinism in children. If iodine is suddenly given, the gland may become over-active and cause Graves's disease, which is commonest in places where goitre is endemic. Though there are other factors in the production of goitre, the latter can always be prevented by increasing the intake of iodine, whether by using iodized salt, which contains 0·02 per cent of sodium iodide, or by administering 0·1 grm. sodium or potassium iodide daily for ten days in the spring and autumn, or by taking plenty of sea fish in the diet; fish liver oils are very rich in iodine. In goitrous regions it has been found that the cabbages and potatoes grown locally contain less iodine than elsewhere.[6]

Phosphorus.

Phosphorus in the organic form is contained in the phosphoproteins, combined with fat as lecithin and with carbohydrate; it is an essential constituent of the structure of cells and their nuclei. Phosphates are present as esters inside the cells and as inorganic phosphates in the body fluids (*see* Calcium). Phosphorus is concerned with the metabolism of carbohydrate and fat; it is necessary in blood coagulation; combined with calcium it is the most important mineral constituent of bones and teeth; as phosphocreatine it takes part in muscular contraction; it acts as a buffer in the cells, preventing too great an alteration in hydrogen ion concentration, and in the form of acid sodium phosphate as a buffer in urine. The amount of inorganic phosphorus excreted in the urine each day is 0·3 to 2 grm. and there are 3 mg. per cent present in blood plasma.

Phosphorus is present in eggs and all flesh foods in amounts usually between 200 and 300 mg. per cent of the cooked food. Like calcium, large amounts are contained in cooked organs, up to a maximum of 596 mg. per cent in cooked sweetbread and 576 mg. in calf's liver. Milk and cream contain between 100 and 200 mg. and butter 50 mg., while cheese is often very rich. There is usually not above 100 mg. present in fruit and most vegetables. Baked beans (100) and boiled haricot beans (122), peas, fried mushrooms (166), pea-nuts (145),* walnuts (298)* contain most; vegetables usually contain rather more, while beans and nuts are very rich, containing between 1,000 and 1,500 mg. per cent. Phosphorus is so widespread in nature that there must always be plenty of it present

* These figures exclude "phytin phosphorus", which is not available in nutrition.

in the food; but deficiency may occur owing to faulty absorption in the intestine and an important function of vitamin D is to facilitate this absorption. Without it the blood phosphate falls and rickets or osteomalacia follows. In other cases of rickets the blood calcium is low and this is the case in renal rickets where the blood phosphate is abnormally high due to the kidneys' failure to excrete it.

Sulphur.

Sulphur is present in proteins, as cystine, cysteine and other compounds, and in glutathione, the ferment that causes oxidations and reductions in the body. In the cells and body fluids it is present as organic sulphur and in the oxidized form as ethereal and mineral sulphates. These three substances are all found in the urine; like phosphorus it is present in practically all foods. Eggs and many fish and shell-fish, half polished rice and nuts contain unusually large amounts—between 500 and 1,000 mg. per cent. The sulphate of the blood rises in the later stages of renal disease owing to the kidneys' failure to excrete it. It is difficult to see how any sulphur deficiency can occur.

Acids and Bases.

Emphasis has been laid on the relative amounts of acid and basic radicals in food-stuffs. These are obtained by ashing the food-stuff under controlled conditions, so as to prevent the escape of volatile substances such as sulphur. The excess of acids over bases or vice versa is then determined by titration. The chief bases are the oxides of sodium, potassium, calcium, magnesium, manganese and iron, while the chief acid radicals are chlorine, and the oxides of phosphorus and sulphur, the two latter arising mainly from the oxidation of protein, and there are also oxalic, benzoic, hippuric acids, etc. Practically all fruits, including the so-called acid fruits, and vegetables, milk, chestnuts, coconut and unrefined sugar (brown candy sugar) yield an alkaline ash, while most other nuts, all cereals, flesh foods and organs, eggs, oysters and cheese yield an acid ash, because many of the latter contain a high proportion of protein, which on oxidation yields phosphates and sulphates. Where there is failure of kidney function, the alkaline foods are usually chosen in excess of the acid yielding foods, since acids are more difficult to excrete; this is shown by the retention in the blood of phosphates and sulphates in advanced kidney disease. A simple way of prescribing an alkaline diet is to use potatoes instead of bread and biscuits, and milk (2 pints) instead of eggs and flesh foods, and to give plenty of other vegetables and fruit; butter and cream

would be allowed. Such a "lacto-vegetarian" diet of rather low protein content would be suitable for a patient with some renal insufficiency; nor will the salt content be particularly high. T and U are diets containing a moderate amount of protein.

[1] Reference should also be made to J. P. Peters and D. D. Van Slyke *Quantitative Clinical Chemistry* and R. A. McCance *Goulstonian Lectures*, Royal College of Physicians, *Lancet*, 1, 643, 704, 765, 823, 1936; and *Proc. Roy. Soc. B.*, 119, 245, 1936.

[2] F. L. Apperly, *Lancet*, 1, 5, 1936.

[3] T. P. Chou and W. H. Adolph, *Biochem. J.*, 29, 476, 1935.

[4] See also L. J. Witts, *Lancet*, 1, 1, 1936.

[5] J. F. Brock, Communication to Association of Physicians, 1935.

[6] J. F. McClendon and C. E. Holdridge, *Biochem J.*, 29, 272, 1935.

Note. Carrageen moss (dried), obtained from Ireland and used for making jellies, contains very large amounts of sodium, potassium, calcium, iron, manganese and chlorine, and is also quite rich in copper and phosphorus.

ADDENDUM

Protamine Zinc Insulin.

Zinc is widely distributed in nature. It is present in the pancreas and in insulin, however prepared. Success is now claimed for its use when added to Hagedorn's protamin insulin (p 18)[1] [2] The extent and duration of the fall in blood sugar is more pronounced, but hypoglycaemic reactions are less common and unlike protamine insulin it is effective in severe ketosis

Provisional recommendations.—Protamine insulins are given, always by subcutaneous injection, (1) when there is a difficulty in controlling the diabetes during the night, or early morning, (2) to prevent rapid changes from hyperglycaemia often with ketosis to hypoglycaemia, (3) to reduce the number of injections, provided the patient is leading a regular life as regards diet and exercise Hagedorn's "insulin retard" produces its maximum effect in 6 to 10 hours, wearing off in 12 to 18 In mild cases one dose may be enough, given either at night or in the morning, in more severe cases morning and evening doses are given, or one dose is given in the afternoon to act through the night and soluble insulin before breakfast Zinc protamin insulin in doses of 15 to 25 units acts most strongly 8 to 12 hours later, and 14 to 22 hours later in larger doses, while the effect may still be present after 24 hours A "basal" dose, ⅔ of the previous 24 hourly dose, is given before breakfast to last through the night In order to control the blood sugar after breakfast, it may be desirable to inject soluble insulin simultaneously, this can be taken up into the syringe without the two insulins becoming mixed, a trial may be made with half the previous morning dose, and insulin retard may be substituted if the blood sugar rises again too much after lunch It may be advisable to spread the carbohydrate more evenly through the day, with an extra meal at 10 p m, though when soluble insulin is added the largest amount will be taken at breakfast. Stabilization is established in 3 or 6 days Treatment must be modified to suit the case. Hypoglycaemic attacks are apt to come on insidiously and are more prolonged and difficult to treat than with soluble insulin In diabetic coma the new insulin, given with soluble insulin at the beginning, prevents the subsequent rise of blood sugar. (See also Lawrence, Archer and Hunsworth, *Brit. Med. J.*, 1, 487, 541, 1937)

[1] D. A Scott and A M Fisher, quoted by Rabinowitch.

[2] I. M. Rabinowitch and others, *Canad. Med. Ass. J.* 35, 239, 1936

APPENDIX

CONTAINING

DIET TABLES, 211 RECIPES AND 21 SPECIMEN DIETS

E. P. POULTON, D.M. AND MARY D. HAWKEY

The use of these tables is explained on pp. 9-12 and elsewhere in *Diet and Recipes and the Treatment of Diabetes and Obesity* by E. P. Poulton, D.M., published by the Oxford University Press

Pages 65-105 *which contain the diet tables, recipes and four specimen diets are published separately for daily use in the home*

TABLE I

EIGHT SERIES OF STANDARD DAILY DIET FORMULAS

	Carbohydrate to Fat Ratio.																							
	1 to 2			1 to 1½			1 to 1			2 to 1			3 to 1			4 to 1			5 to 1*			6 to 1		
Cals.	CR	FR	P grm.	CR	FR	P grm	CR	FR	P grm.	CR	FR	P grm.	CR	FR	P grm.	CR	FR	P grm.	CR	FR	P grm.	CR	FR	P grm.
200	½	2	-7	½	1½	5	½	1	16	1	1	6	1½	1	-1	1	½	17	1½	½	7	1½	½	7
800	1½	6	20	2	6	18	2½	5	31	4	4	24	4½	3	37	5	2½	38	5	2	50	6	2	30
										3½	3½	46	3	2	90	4	2	70				4½	1½	71
1,200	2½	10	16	3	9	27	4	8	31	6	6	37	7½	5	29	8	4	42	9	3½	33	9	3	45
	2	8	71	2½	7½	72	3½	7	64	5½	5½	58	6	4	82	7	3½	73	7½	3	75	7½	2½	86
1,600	3	12	58	4	12	36	5	10	63	8½	8½	28	10½	7	22	11	5½	45	12½	5	27	13½	4½	18
	2½	10	113	3½	10½	81	4½	9	96	8	8	49	9	6	74	10	5	77	11½	4½	58	12	4	60
										7½	7½	70				9	4½	103	10	4	100	10½	3½	101
2,000	4	16	45	5	15	45	6½	13	63	10½	10½	40	13½	9	14	14	7	49	15	6	52	16½	5½	33
	3½	14	100	4½	13½	90	6	12	96	10	10	61	12	8	66	13	6½	80	14	5½	83	15	5	74
										9½	9½	82	10½	7	119	12	6	112	12½	5	124	13½	4½	116
										9	9	104												
2,100	5	20	32	6	18	54	8	16	62	13	13	31	15	10	58	18	9	21	19	7½	35	19½	6½	48
	4½	18	87	5½	16½	99	7½	15	95	12½	12½	52	13½	9	111	17	8½	52	17½	7	77	18	6	89
										12	12	73				16	8	84	16½	6½	108	16½	5½	131
										11½	11½	95				15	7½	116						
2,800	5½	22	74	7	21	63	9½	19	62	15	15	43	18	12	51	20	10	56	21½	8½	60	23½	7½	63
	5	20	129	6½	19½	108	9	18	95	14	14	85	16½	11	104	19	9½	87	20	8	101	21	7	104
										13½	13½	107												
3,200	6½	26	61	8	24	72	10½	21	94	17	17	55	21	14	42	24	12	28	24	9½	85	25½	8½	78
	6	24	116	7½	22½	117	10	20	127	16½	16½	76	19½	13	95	23	11½	50	22½	9	126	24	8	119
										16	16	99				22	11	91						
3,600	7	28	103	8½	25½	125	12	24	92	19	19	65	24	16	35	26	13	63	27½	11	79	28½	9½	93
										18	18	110	22½	15	83	25	12½	94	26½	10½	110	27	9	134

Calculated on basis 1 grm. carbohydrate and 1 grm. protein give 4·1 Cals.; 1 grm. fat gives 9·3 Cals.

Iso-Calorie equivalents. In any formula ½ CR can be replaced by 10 grm. protein, ½ FR by 11 grm. protein; 1 CR is nearly equivalent to ½ FR; ½FR is nearly equivalent to 50 Calories; 12 grm. protein are equivalent to 50 Calories

* To avoid awkward fractions some of these formulas are not exactly 5 to 1.

TABLE 2

20-GRAM CARBOHYDRATE RATIONS (CR)

20 grm. carbohydrate are contained in	Grm. or Oz.		These amounts also contain protein, grm.
Arrowroot	21	¾	0
Barley, Pearl	26	¾	2
Beans, Baked, tinned	128	4½	7·5
,, Butter, as served	130	4½	9
,, Haricot, as served	137	4¾	9
Beetroot, as served	112	4	2
Bisco-rye (*H. & P.*)—3	26	⅞	3
Biscuits, Water—2½	24	⅞	2
,, Thin Captain—3½	25	⅞	3
Bread, White	38	1⅜	3·5
,, Brown (Hovis)	49	1¾	5
,, Wholemeal	47	1⅝	4
Cornflour	22	¾	0
Cream of Wheat	27	1	3
Crumpets (Lyons)—4/5	46	1⅝	4
Custard Powder	24	⅞	0
Dixon's Maltose	21	¾	0
+Dried Fruit, edible portion			
Apricots	51	1¾	2·5
Currants	35	1¼	0·5
Dates	35	1¼	0·5
Figs	42	1½	1·5
Peaches	42	1½	1·5
Prunes	55	1⅞	1·5
Raisins	34	1¼	0·5
Sultanas	34	1¼	0·5
Egg Powder	40	1⅜	2
Energen, Bismeal	40	1⅜	14·5
,, Bread, Loavette, 1½ baton, or 17 rusks	40	1⅜	16
,, Flour	31	1⅛	6·5
,, Tapioca	26	⅞	2
Flour, high-grade	27	1	3
,, (Hovis)	31	1⅛	5
,, Self-raising	28	1	3
,, Wholemeal	28	1	4
Force	26	⅞	3
+Glucose	22	¾	0
+Golden Syrup (Lyle's)	27	1	0
Grapenuts	24	⅞	2·5
Hominy	25	⅞	2
+Honey	25	⅞	0
+Jam and Marmalade			
(Chivers, Hartley)	31	1⅛	0
(Crosse & Blackwell, Tiptree)	32	1⅛	0
(Cooper's, Oxford)	35	1¼	0
Lentils, dried (W. W. Payne's analysis)	38	1⅜	9
,, ,, weighed, then washed before use (W. W. Payne's analysis)	44	1½	12
,, ,, as served	121	4¼	8
Macaroni	27	1	3·5
,, boiled	126	4½	4
Mellin's Food	26	1	2·5
+Mincemeat (Heinz)	50	1¾	1

+ The portion of food contains more than 10 grm. soluble sugar.

TABLE 2.—20-Gram Carbohydrate Rations (CR)—*continued*

20 grm. carbohydrate are contained in	Grm.	or Oz.	These amounts also contain protein, grm.
Oatmeal—2 grm. fat	30	1	5
Ovaltine	28	1	4
Parsnips	164	5½	1·5
Peas, dried, boiled	116	4	8
,, ,, weighed then washed and soaked before use (W. W. Payne's analysis)	45	1½	9·5
,, split, as served	101	3½	8·5
,, tinned, as purchased	135	4½	8
Post Toasties	25	⅞	2
Potatoes, new boiled	121	4½	2
,, old boiled	113	4	1·5
,, roast 45 min in shallow fat	81	2⅞	2·5
Quaker Oats—2 grm fat	31	1⅛	5
Rice, as purchased (W. W. Payne's analysis)	25	⅞	2
,, weighed, then washed before use (W. W. Payne's analysis)	28	1	2
,, weighed, then washed and boiled before use (W. W Payne's analysis)	30	1	2
,, boiled, weighed as such	72	2½	2
Ryvita Crisp Bread	27	1	3
Sago	20	¾	2·5
Shredded Wheat	28	1	3
+Sugar	21	¾	0
Sweet Potatoes, boiled	111	3⅞	1
Tapioca	23	¾	0
Toast, ordinary	32	1⅛	3·5
,, very dry	25	⅞	3·5

+ The portion of food contains more than 10 grm. soluble sugar.

TABLE 3

HALF CARBOHYDRATE RATIONS (½ CR)

10 grm. carbohydrate are contained in :—	Grm	or Oz	These amounts also contain protein, grm.
Cheltine Bread, Brown No. 1	30	1	0·5
No 2	35	1¼	14
,, White	34	1¼	7·5
,, Rolls, Brown No. 1	30	1	0·5
,, White	29	1	9
,, Rusks, Brown and White	19	⅝	5

FRUIT—fresh and ripe unless otherwise stated.

Weights with skins, etc., as purchased. Oz.		Edible portion, stalks discarded		
4½	Apples, eating, flesh only	93	3¼	0·5
4	,, cooking, flesh only	116	4	0·5
6½	Apricots with skin, no stones	166	5¾	1
3½	Bananas without skin	58	2	0·5
6	Blackberries	173	6	2
3½	Cherries, eating, no stones	93	3¼	0·5
3½	,, cooking, no stones	96	3⅜	0·5
—	Crab Apples	88	3⅛	1
11	Cranberries	317	11	1
6	Currants, Black	168	5¾	1·5
9½	,, Red	252	9	3

TABLE 3.—Half Carbohydrate Rations (½ CR)—*continued*

10 grm. carbohydrate are contained in:—

Weights with skins, etc., as purchased. Oz.		Edible portion, stalks discarded. Grm.	Oz.	These amounts also contain protein, grm.
7½	Currants White	198	7	2·5
3	Custard Apple	61	2⅛	1·5
4½	Damsons, no stones	115	4	0·5
4½	Figs, green with skin	117	4⅛	1·5
11½	Gooseberries, green, no tops and tails	326	11½	3·5
4½	,, ripe, no tops and tails	120	4½	0·5
2½	Grapes, black, flesh only	72	2½	0·5
2½	,, white, flesh only	69	2½	0·5
15	Grapefruit, flesh only	210	7⅜	1·5
3½	Greengages, no stones	94	3⅛	1
8	Guavas, common	182	6½	2
7	,, strawberry	166	5⅞	2
11½	Loganberries	326	11½	3·5
6½	Mangoes	123	4½	1
4½	Medlar	105	3⅞	0·5
12½	Melon, Cantaloupe, flesh only	210	7⅜	2
13	,, Yellow, flesh only	222	7⅞	1·5
14	,, Water, flesh only	185	6½	1
4½	Mulberries	137	4⅞	2
3½	Nectarines	90	3⅛	1
6	Oranges, flesh only	130	4⅝	1
0	,, juice	118(c.c.)	4⅛	0·5
6½	Papayas	123	4½	1
15	Passion Fruit	179	6½	5
4½	Peaches, flesh only	122	4½	0·5
5½	Pears, *eating, flesh only*	106	3⅞	0·5
5½	,, cooking, flesh only	119	4⅛	0
–	Persimmons, Japanese	70	2½	0·5
2½	,, American	59	2	0·5
6	Pineapple, flesh only	96	3⅜	0·5
+	,, tinned	31	1	0
4½	Plums, Victoria, dessert, no stones	115	4	0·5
7	,, cooking, no stones	179	6½	1
0	Pomegranate juice	96(c.c.)	3⅜	0·5
14	Pumpkin	326	11½	2
	Quinces	176	6½	0·5
6⅞	Raspberries	198	7	2
6½	Strawberries	179	6½	1
7	Tangerines	139	4⅞	1·5
	RELISHES (*Heinz*)			
	Apple butter	25	⅞	0
	Chili Sauce	36	1¼	1
	Indian Relish	36	1¼	0
	Sweet Pickles	28	1	0
	Sweet Mustard Pickle	40	1⅜	0
	Tomato Ketchup	40	1⅜	1
	Tomato Sauce	250	8¾	2
	Calf's Foot Jelly	58	1	2·5
	VEGETABLES, CLASS 2.			
	Broad Beans	156	5½	6·5
	Carrots, boiled, old	258	9	1·5
	,, ,, young	247	8½	2
	Horseradish, raw	101	3½	4·5
	Leeks, boiled	241	8½	4·5
	Onions, boiled (–5 grm. fat)	374	13	2
	,, raw	213	7½	1·5

TABLE 3—Half Carbohydrate Rations (½ CR)—*continued*

10 grm. carbohydrate are contained in :— Weights with skins, etc., as purchased.	Edible portion, stalks discarded. Grm.	or Oz.	These amounts also contain protein, grm.
Peas, fresh, boiled	144	5	7
Radishes	397	14	4
Spring Onions, raw	130	4½	1
Swedes, sliced and boiled	282	10	2·5
Tomatoes, raw	400	14	3·5

An ordinary helping of vegetables (Class 2) may be taken with a meal without weighing. The vegetables, Class 1, detailed below, can be taken cooked or raw at any time in any quantity, since the half carbohydrate ration varies between 480 grm (17 oz) and 1,100 grm (38 oz) and more. If plenty of vegetables of Class 1 and 2 are eaten in the day it is sufficient to look upon the amount as equivalent to one-half carbohydrate ration, and 5 grm protein. There is but little loss of weight on boiling fresh vegetables; spinach is an exception.

VEGETABLES, CLASS 1. As usually eaten, fresh or boiled

Artichokes, Globe	Cucumber	Mustard and Cress.
Artichokes, Jerusalem.	Egg Plant.	Rhubarb.
Asparagus.	Endive.	Salsify.
Broccoli.	French Beans.	Savoy Cabbage.
Brussels Sprouts.	Greens.	Scarlet Runners.
Cabbage.	Kale, Scottish.	Sea Kale.
Cauliflower.	Lemon Juice.	Spinach.
Celeriac.	Lemons.	Turnips.
Celery.	Lettuce.	Turnip-tops.
Chicory.	Marrow.	Watercress.

TABLE 4

10-GRAM FAT RATIONS (FR)

10 grm. of fat are contained in :—	Grm.	or Oz.	These amounts also contain protein, grm.
Akoli Biscuits (H & P)	32	1¼	18
Almond Flour (Callard)	18	¾	4·5
CREAM CHEESE.			
Gervais	20	¾	1·5
Lactic	17	¾	1
Pommel, English	22	¾	1·5
WHOLE MILK CHEESE			
Boudon	48	1¾	7·5
Brie	36	1¼	6·5
British Army	29	1	7
Camembert	44	1½	9
Cheddar	31	1¼	7·5
Cheshire	31	1¼	7
Gloucester	36	1¼	7
Gorgonzola	29	1	8
Gruyère (Emmentaler)	31	1¼	8·5
Little Wilts	31	1¼	7
Neufchatel	24	¾	5·5
Parmesan (Argentine)	29	1	10
Roquefort	31	1¼	8
Stilton	24	¾	6
St. Ivel lactic	37	1¼	8·5
Wensleydale	29	1	8·5

TABLE 4.—10-Gram Fat Rations (FR)—*continued*

10 grm. of fat are contained in :—	Edible portion cooked. Grm. or Oz.		These amounts also contain protein, grm.
FATS.			
Butter, Margarine (Maypole)	12	½	0
Beef, Ham and Mutton Fat	11	½	1
Pork Fat	13	½	1·5
Dripping, Lard, Olive Oil, Suet	10	½	0
Cream	25	1 (by volume)	1
FISH.			
Weight with bones, etc., as purchased. Oz.	Edible portion cooked.		
3 Bloaters, grilled, flesh only	58	2	12
3½ Eel, stewed, all except bones	55	1⅞	6
2½ Herring, fried in oatmeal, unsplit	53	1⅞	11·5
5½ Mackerel, fried in oatmeal, no skin	88	3⅛	18
4 Salmon, steamed, flesh only	77	2¾	14·5
— Sardines, after drawing off oil	44	1½	9
1½ Sprats, *fried in deep fat, without heads*	26	⅞	6
2½ ,, smoked, grilled, without heads	43	1½	11
POULTRY.			
Oz.			
3½ Duck, roast, with basting	42	1½	9·5
4 Goose, roast, with basting	45	1⅝	12·5
7 Pigeon, boiled	74	2⅝	15·5
10 ,, roast, with basting	76	2⅝	20
MEAT, ETC.			
1½ Bacon rashers, back, fried, including fat	19	⅝	4·5
2½ ,, ,, collar, fried, including fat	29	1	8
1½ ,, ,, gammon, fried, including fat	30	1	9
2 ,, ,, streaky, fried, including fat	22	¾	5
— *Beef, corned, eaten as purchased*	67	2⅜	15
— ,, sirloin, roast	81	2⅞	22
2½ ,, *rump steak, fried lightly*	49	1¾	10
2½ ,, ,, grilled	46	1⅝	11·5
3 ,, salt silverside, boiled	61	2⅛	17
— ,, topside, roast	67	2⅜	18
2½ Ham, purchased sliced and cooked, lean only	74	2⅝	17
4½ Heart, sheep's, roast, all	68	2⅜	17
4 Liver, calf, rolled in flour, fried	69	2⅜	20
3½ ,, Ox,* rolled in flour, fried	63	2¼	18·5
2½ *Mushrooms, fried 5 min. in dripping*	45	1½	1
5 Mutton chops, grilled	43	1½	13·5
1 ,, cutlets, *fried egg and bread-crumbs*, most fat removed	20	¾	3·5
— ,, leg, boiled, most fat removed	60	2⅛	16
— ,, leg, roast	49	1¾	12
3½ ,, scrag neck, stewed 4 hours, all edible except bones	41	1⅜	10
— Pâté de foie gras	23	¾	3·5
— Pork, leg, roast, most of fat removed	43	1½	10·5
2½ ,, loin, roast, most of fat removed	28	1	7

TABLE 4.—10-Gram Fat Rations (FR)—*continued*

10 grm. of fat are contained in :—	Edible portion cooked. Grm. or Oz.		These amounts also contain protein, grm.
5 Pork, loin chops, grilled, most of fat removed	37	1¼	11
2½ ,, loin, salt, smoked, purchased sliced and cooked, lean only ..	67	2½	15
2½ Sausage, Bologna	57	2	10·5
4 Tongue, Ox, pickled in salt and sugar, boiled, muscular part ..	42	1½	8
4½ ,, Sheep's, fresh, stewed, muscular part	42	1½	7·5

* Add 14 grm. bread to make ½ CR + 1 FR.

TABLE 5

HALF FAT RATIONS (½ FR)

5 grm. of fat are contained in :—	Grm. or Oz.		These amounts also contain protein, grm.
BREAD, SPECIAL, ETC.			
Callard's Biogene Bread	28	1	0·5
,, Casoid ,, ...	29	1	17·5
,, Gluten ,, ...	21	¾	15
,, Improved Kalari Biscuits ..	22	¾	11
,, Biogene Pastry Flour	31	1¼	18·5
,, Biogene Cocoa	28	1	9·5
CHEESE			
Blue Dorset	35	1¼	14·5
Caerphilly	49	1¾	13·5
Dutch	28	1	10·5
Parmesan	29	1	13
CRUSTACEA, ETC.			
Weights with shell, bones, etc., as purchased. Oz.			
17½ Crab, boiled .. +1 grm Fat*	78	2¾	15
8½ Lobster, boiled .. +4 grm Fat	71	2½	15
6½ Prawns, bought cooked +5 grm Fat	71	2½	15
— Cockles, bought cooked without shells +6 grm. Fat	136	4¾	15
14 Mussels, eaten raw +5 grm Fat	128	4½	15
18 ,, boiled .. +5 grm. Fat	89	3½	15
4½ Oysters, eaten raw, no shell +5 grm Fat	49	1¾	5
4½ Scallops,† steamed, no shell +5 grm. Fat	67	2½	15
20 Whelks, bought cooked, no shell +5 grm Fat	85	3	15
20 Winkles, bought cooked, no shell +5 grm Fat	85	3	15
FISH.			
— Caviare	32	1¼	12
2½ Cod Roe, baked in vinegar +4 grm Fat	62	2½	15
3½ Kippers, baked, flesh only	44	1½	10
— Salmon, tinned, as purchased ..	83	3	16·5

* In each case the fat has been calculated as butter.
† Bought without shell.

TABLE 5.—*Half Fat Rations (½ FR)—continued*

5 grm. of fat are contained in :—		Grm.	or Oz.	These amounts also contain protein, grm.
2	Stockfish (Cod), soaked 24 hours, boiled, without skin .. +6 grm. Fat	47	1⅝	15
4½	*Varieties (mostly white fish) not previously mentioned,** steamed +4 grm. Fat	73	2½	15
	GAME, POULTRY.	Edible portion cooked.		
3½	Chicken, boiled	49	1¾	13
6	,, *roast with basting*	68	2⅜	20
3½	Grouse, roast, with basting +2 grm Fat	50	1¾	15
5½	Guinea-fowl, roast, with basting ..	61	2⅛	20
5	Hare, stewed	62	2⅛	18
7	,, roast, with basting	71	2½	22
4	Partridge, roast with basting +2 grm. Fat	42	1½	15
4	Pheasant, roast, with basting *+2 grm. Fat*	*54*	*1⅞*	*16*
6½	Rabbit, stewed	65	2⅛	17
5	Turkey, roast with basting	65	2⅛	19·5
3	Venison Haunch, *roast* with basting +2 grm. Fat	50	1¾	15
	MEAT, ETC.			
3½	Beef steak, stewed 4 hours, most fat removed	58	2	18
—	,, topside, boiled, most fat removed	61	2⅛	20
3½	Brains, calf's, boiled +2 grm. Fat	86	3	10
3	,, sheep's, boiled +2 grm. Fat	75	2½	9
2	Eggs, Hen's,† average : 1	49	1¾	6
4	Kidney, Sheep's, cut in half, fried ..	55	2	15·5
4	,, Ox, small pieces, stewed +3 grm. Fat	58	2	15
2	Olives, in brine	45	1⅝	4
3½	*Sweetbread*, stewed	55	2	12·5
6½	Tripe, dressed, stewed +4 grm. Fat	83	3	15
3	Veal Cutlet,‡ fried with egg and crumbs	62	2⅛	19
2	Veal fillet, roast	43	1½	13·5

* Preface.

† Actually contains 5·5 grm. Fat, see also Table.

‡ Add 13 grm. bread to make ½ CR + ½ FR.

TABLE 6

FOODS CONSISTING MAINLY OF PROTEIN

15 grm. protein, equivalent to 61 Calories, are contained in :—

Crustacea, etc. Prawns and shell fish (Table 3) in amounts stated without fat.
White Fish, boiled or steamed (Table 3) in amounts stated without fat.
Cod Roe, baked (Table 3) in amounts stated without fat.
Tripe, dressed (Table 3) in amounts stated without fat.
Gelatine, 16 grm., Plasmon 18 grm.

TABLE 7

FOODS CONTAINING CARBOHYDRATE, PROTEIN AND FAT

The amount of food mentioned below in (c cm.)	Grm. or Oz. contains		CR	FR	P grm.
Avocado Pear	444	15½	½	3½	5
Milk, measured in c cm. – 2 grm. Fat	200	7	½	½	7
" " + 2 grm. Fat	370	13	1	1½	13
" "	570	20 1 pt.	1½	2	20
" "	1,130	40 2 pt.	3	4	40
Butter Milk	200	7	½	0	6
Koumiss	200	7	½	½	6
Benger's Food, E.1, prepared as directed	340	12	1½	1	12
Bean Soup (Heinz)	100	3½	½	½	5
Biscuits.					
Bath Oliver (Fortt) ..3½ large	46	1½	1½	½	4·5
Breakfast (H. & P.) ..7 ..	54	1½	2	½	5·5
Cornish Wafer (H & P.) ..3½ ..	34	1½	1	1	2·5
Cream Cracker (H & P.) ..3½ ..	28	1	1	½	2
Digestive (H & P.) ..4 ..	62	2½	2	1½	3·5
Fancy Cracknel (H & P.) ..6 ..	60	2½	2½	½	7
Fine Water (H. & P.) ..9 ..	68	2½	2½	½	8
Marie (H. & P.) ..7 ..	50	1½	2	½	4
Osborne (H & P.) ..6½ ..	50	1½	2	½	4
Petit Beurre (P F) ..4½ ..	44	1½	1½	½	4·5
Shortbread (Greenock) (P F) ..2½ ..	31	1½	1	1	2·5
Thin Arrowroot (H & P) ..6½ ..	39	1½	1½	½	2·5
Wheatmeal (H & P) ..2½ ..	34	1½	1½	½	3
Breads, Special					
Callard's Cellulon 15% Bread ..	62	2½	½	1	10
" " 15% Biscuits ..	56	2	½	1	29
Energen Endobran : 4, + 2 grm Fat	56	2	½	½	10
Heudebert					
Azote-free Bread ..1 ..	43	1½	1½	½	1
Harrogate Biscottes ..2 .	14	½	½	0	2
Biscottes without salt ..8, –2 grm. Fat	75	2½	3	½	10
Longuets " ..2 "	57	2	2	½	7·5
Special diabetic bread ..1 ..	28	1	½	0	15
Van Abbott, Midolia biscuits . 2	38	1½	½	1½	7
Chocolate :					
+ Bournville	49	1½	1½	1½	2
Fruit and Nut	17	½	½	½	1
+ Nut	39	1½	1	1½	2
+ Breakfast (Cadbury) + 4 grm Fat	26	1	1	½	1·5
+ Dairy Milk (Cadbury) . ..	59	2	1½	2	5
+ Fruit and Nut	35	1½	1	1	2·5
Meltis, Sionon + 10 gm. Bread ..	24	½	½	1	2·5
Milk (Fry)	57	2	1½	2	5
Milk (Rowntree)	58	2	1½	2	4·5
Supex + 11 grm Bread	20	½	½	1	1
Cocoa, Bournville	56	2	½	1½	10
" Energen	32	1½	½	½	10
+Fig Pudding (Heinz)	40	1½	1	1	0·5
Ice-creams (Walls), 2½d and 2d. blocks (W. W. Payne's analysis)	110	3½	1	1½	4
Ice-creams (Lyons), vanilla	48	1½	½	½	2
1½ 2d. " Kups "					
1½ " Big Bars "					
+Horlick's Malted Milk	62	2½	2	½	10

TABLE 7.—Foods containing Carbohydrate, Protein and Fat—*continued*

The amount of food mentioned below in (c.cm.)	Grm. or Oz. contains	CR	FR	P grm.
FRIED FISH.				
All varieties of white fish (weighing 3 oz. as purchased) + 10 grm. Bread	84	3	½	1	16
The fish was well dried with a cloth, brushed over with a smooth paste of flour and water, 1-2 parts, then dipped into fine breadcrumbs (McCance & Shipp)					
Cod Roe, parboiled, sliced, fried in crumbs (3½ oz. as purchased) + 13 grm. Bread	84	3	½	1	17
Herring Roe, soft, rolled in flour, fried (2½ oz. as purchased) + 13 grm. Bread	63	2½	½	1	15·5
FRIED VEGETABLES.					
Onions, cut up, 4 min. in dripping ..	110	3½	½	3½	2
Potato Chips, 6 min in deep fat* ..	60	2½	1	½	2·5
Tomatoes, cut in halves, 3 min. ..	336	12	½	2	3·5
NUTS.					
Almonds, edible portion	19	½	0	1	4
Barcelona Nuts	16	½	0	1	2
Brazil Nuts ,, ...	16	½	0	1	2
Chestnuts ,, ...	30	1	½	0	0·5
Cob Nuts ,, +17 grm. Bread	14	½	0	1	2
Coconuts ,, +17 grm. Bread	28	1	0	1	1
Peanuts ,, +14 grm Bread	26	¾	½	1	7·5
Pecan Nuts ,, (W. W. Payne's analysis)	12	⅛	0	½	1·5
Pignolias (Pine kernels) ,, +16 grm Bread	20	¼	½	1	8·5
Pistachios ,, +14 grm. Bread	18	¼	¼	1	5
Walnuts ,, ...	9	⅛	0	1	2·5
Robinson's patent Groats	59	2	2	½	7·5
Sandwich Spread (Heinz)	59	2	½	2	1
+Plum Pudding (Heinz)	64	2½	1	1	3
Queen Olives, Green (Heinz) +2 grm. Butter	100	3½	½	1½	1
Suet (Atora)	106	3½	½	9	0

* See also Recipe 74, where the chips are fried twice over.

TABLE 8

ARTICLES OF NEGLIGIBLE FOOD VALUE

These articles can be taken as required:

Agar Jellies. (See Recipes below.)
Bovril.
Clear Soups and Broths.
Coffee.
Kia Ora, unsweetened.
Lemonade, unsweetened.
Lemon Juice, unsweetened.
Lime Juice, unsweetened.
Medicinal Paraffin.
Mint.

TABLE 8.—Articles of Neglible Food Value—*continued*

These articles can be taken as required:

Mixed Pickles.
Mustard.
Oxo.
Parsley.
Pepper.
Rennet.
Sage.
Salt.
Sionon (Bayer), a sweetening agent which may be used for icing cakes
Soda, Potash and Lithia Water.
Tea.
Tonic Water,* sweetened with saccharine, guaranteed free from Sugar (Schweppes).
Vanilla and other flavouring materials not containing sugar or starch.
Yellow Spread, Lister's (Van Abbott)—substitute for butter.

Agar Agar Jellies. 3 grm. (heaped teaspoon) agar agar, 5 oz (1 gill) liquid for each jelly. Allow agar agar to soak for some time in the liquid, bring slowly to boiling point, boil gently for two or three min., strain into a wetted mould. If liquid evaporates to any extent add water to make up quantity.

Bovril Jelly. Add 1 teaspoonful Bovril, salt, pepper.

Coffee Jelly. Use 5 oz made coffee, 1 saccharine tablet

Lemon Jelly. Add 1 oz lemon juice (half lemon), 1 saccharine tablet

Sherry Jelly. Add 1 oz sherry wine, 1 saccharine tablet.

Tomato Jelly. ½ lb tomatoes, stew in a little water, add salt and pepper, press through gravy sieve, use 5 oz tomato juice and proceed as above

Savoury, Bovril, or Tomato Jellies. Add a teaspoonful chopped parsley, 8 grm. or 15 grm. (½ oz) chopped celery or 15 grm (½ oz) asparagus tips to the Bovril or tomato jellies.

* Sugar-free "dry ginger ale" and "sparkling lime" are also available.

The attention of the author has been drawn to the fact that by including meat extracts such as Bovril and Oxo among "articles of negligible food value" the general public may gain a different impression of their value from that intended; the best description is "Extras of small calorie value".

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INDEX OF RECIPES

The amount of food mentioned below in	Amount.	Grm.	Oz.	contains CE	FR	P grm.
Hors d'oeuvres.						
1. Hors d'oeuvre I or Luncheon Salads ..	Whole	—	—	1	1	8
2. Hors d'oeuvre II	Whole	—	—	1	1½	8·5
Soups.						
3. Brown Stock	½	—	15	½	0	4
4. White Stock	½	—	20	½	0	10
5. Second or Household Stock	½	—	15	½	0	5·5
6. Artichoke Soup	½	—	10	1	½	6
7. Bean and Tomato Soup ..	½	—	20	3	½	23
8. Celery Soup	½	—	10	1	½	8
9. Hollandaise Soup	½	—	8	½	½	5
10. Kidney Soup	½	—	13	1½	½	15
11. Lentil Soup	½	—	8	2	½	19
12. Mulligatawny Soup ..	½	—	10	1½	½	10
13. Scotch Broth	½	—	8	½	0	1·5
14. Tapioca Cream Soup ..	½	—	5	½	1	3
15. Tomato Soup	½	—	10	1	½	6
Fish.						
16. Baked Halibut + 8 grm. (¼ oz) bread	½	120	4¼	½	1	22
17. Fish Cakes (2)	½	87	3	½	1	10
18. Fish Pie	½	135	4¾	½	½	12
19. Fish Pudding I	½	102	3½	½	½	13
20. Fish Pudding II	½	100	3½	½	½	12
21. Fish Pudding II with Maitre d'Hotel butter	½	103	3¾	½	1	12
22. Fried Fish (2 fillets) ..	½	127	4½	½	1½	24·5
23. Kedgeree	½	93	3¼	½	½	13·5
Savoury Sauces.						
24. Aspic Jelly	½	—	9	½	0	12
25. Bread Sauce I	½	85	3	½	½	3
26. Bread Sauce II	½	82	3	½	½	3
27. Bread Stuffing or Forcemeat	½	36	1¼	½	½	2·5
28 Brown Sauce I	½	87	3	½	½	4
29. Brown Sauce II	½	183	6½	½	1	2
30. Caper Sauce	½	100	3½	½	½	4
31. Cheese Sauce	½	120	4¼	½	1	10
32. Curry Sauce	½	162	5¾	½	½	3
33 Egg Sauce	½	116	4	½	1	7
34. Maitre d'Hotel Butter ..	½	9	¼	0	¼	0
35. Mayonnaise or Salad Dressing	½	128	4½	½	1	6
36. Onion Sauce	½	190	6¾	½	½	4
37. Tartare Sauce	Whole	154	5½	½	1	6
38. Tomato Sauce	½	113	4	½	½	8·5
39. White Sauce I	½	97	3½	½	½	4
40. White Sauce II	½	78	2¾	½	½	3·5
Chutneys.						
41. Apple Chutney	—	94	3¼	½	0	0
42. Gooseberry Bar-le-duc ..	—	17	½	½	0	0
43. Red Tomato Chutney ..	Ordinary helping.			Negligible.		

The amount of food mentioned below in	Amount.	Grm.	Oz.	contains CB	FR	P grm.
Sweet Sauces.						
+ 44. Arrowroot Sauce + 3 grm. butter	½	110	3½	½	½	2·5
+ 45. Chocolate Sauce	½	98	3½	1	½	4
46. Custard Sauce	½	117	4½	½	½	5
+ 47. Golden Sauce	½	30	1	1	0	0
+ 48 Hard Sauce	½	17	½	½	½	0
+ 49. Jam Sauce	½	61	2½	1	0	0
+ 50. Fruit Glaze	½	46	1½	½	0	1
+ 51. Jelly Glaze	½	40	1½	½	0	0
+ 52. Marmalade Sauce	½	30	1	½	0	0
Entrées, Savouries, Made Dishes.						
53. Beef Olives	½	133	4½	½	1	16·5
54. Beef Roll or Veal Galantine +10 grm bread ..	—	67	2½	½	1	13
55. Beef Steak and Kidney Pie	½	77	2½	½	1	12
56. Beef Steak and Kidney Pudding	½	132	4½	½	1	14
57. Casserole of Stewed Steak ..	½	179	6½	½	1½	17
58. Casserole Stew with Barley	½	117	4	½	1	13
59. Casserole of Veal with Macaroni	½	123	4½	½	1	13
60. Cheese Straws or Biscuits ..	½	25	½	½	1	4·5
61. Curry of Fresh Meat ..	½	213	7½	½	1	21
62. Curry of Fresh Meat with Rice	½	285	10	1½	1	23
63 Egg in Aspic	Whole	283	10	½	½	18
64 Curried Eggs (½ egg) ..	½	160	5½	1	½	65
65. Scotch Eggs (½ egg) ..	½	85	3	½	1½	15
66. Haggis	—	143	5	½	2	12
67. Irish Stew	½	202	9½	½	1½	15
68. Macaroni Cheese .. .	½	140	5	1	1	11
69. Mushrooms on Toast ..	Whole	113	4	1	1½	5·5
70. Omelet	½	50	1½	0	1	6
71. Savoury Omelet with Cream	½	64	2½	0	2	6
72. Pork Hot Pot	½	128	4½	½	1	7½
73. Pork Sausages A—Boiled	½	72	2½	½	1½	12
B—Fried	½	58	2	½	1	12
74 Potato Chips	½	42	1½	1	1½	2
75 Potato Crisps ..	½	19	½	½	1	1
76 Potatoes, mashed . ..	½	120	4½	1	½	2·5
77. Savoury Buns (2) . .	½	85	3	½	1·	5
78. Savoury Pudding . ..	½	210	7½	1	1½	11
79. Stewed Sausages .. .	½	115	4	½	1½	7·5
80. Stewed Tripe and Onions	½	162	5½	½	½	14
Pastries and Puddings						
+ 81. Choux Pastry, unbaked ..	Whole	354	12½	4	5½	26
,, baked, after scooping out dough	Whole	170	6	3	4	20
82. Cream Buns (2)	½	49	1½	½	1	3
83 Flaky Pastry, unbaked ..	½	66	2½	1	2	3
baked ..	½	51	1½	1	2	3
+ 84 Lemon Cheese Slices (1) .	½	47	1½	1	1½	2·5
+ 85. *Mince Pies with cream (1)*	½	67	2½	1½	2½	2
86. Flan Pastry, unbaked ..	½	37	1½	1	1	3
baked ..	½	30	1	1	1	3
87. Chester Tart	½	43	1½	1	1½	4

The amount of food mentioned below in	Amount.	Grm.	Oz.	contains CR	FR	P grm.
88. Orange Tart	¼	69	2½	1½	1	3·5
89. Shortcrust Pastry, unbaked	¼	50	1¾	1	1½	3
baked	¼	41	1½	1	1½	3
90. Apple Pie	¼	110	3¾	1	1	2
91. Apple Tart (individual) ..	Whole	14	4	1½	1½	3
92. Jam Tartlet	½	23	¾	½	½	1
93. Lemon Cheese Tartlet ..	¼	68	2½	1½	2	4
+ 94. Mincemeat Tartlet (1) ..	½	57	2	1½	1	2
95. Wholemeal Shortcrust, unbaked	¼	47	1¾	1	1	4
baked	¼	37	1¼	1	1	4
96. Apple Tart (individual) ..	Whole	111	3⅞	1½	1	4
97. Golden Syrup Tart ..	¼	35	1¼	1	½	2
98. Jam Plate Tart	¼	37	1¼	1	½	2
+ 99. Mincemeat Tart	¼	38	1¼	1	½	1·5
+100 Apple Charlotte	¼	122	4¼	1	½	2
101. Batter Pudding, baked ..	¼	113	4	1½	1	10
102. Batter Pudding, steamed ..	¼	142	5	1½	1	10
103. Batter, Apple	¼	184	6½	1½	1	9
104. Batter, Red Currant ..	¼	137	4¾	1	½	5
105. Bread and Butter Pudding	¼	193	6¾	1½	1	10·5
106. Canary Pudding	¼	50	1¾	1	1	3·5
+107. Canary Puddings (1) ..	¼	72	2½	1½	1	3·5
+108. *Chocolate Pudding* ..	¼	150	5¼	1½	½	7·5
+109. Christmas Pudding ..	⅛	40	1⅜	1	½	1·5
110. Currant Dumpling ..	⅛	70	2½	1½	1	7
111. Custard Blancmange ..	¼	*124*	*4¼*	½	½	*5*
+112. Custard with custard powder	Whole	295	10½	1½	1	10
+113. Custard Pudding, baked ..	Whole	330	11½	1	1½	16
+114. Custard Pudding, steamed	Whole	330	12½	1	1½	16
115. Cup Custards	¼	117	4	½	½	5
116. Fruit Dumpling	¼	212	8½	1½	1	3·5
+117. Fruit Dumpling, baked ..	¼	225	8	1½	1	3·5
118. Jam Layer Pudding, steamed	¼	82	3	1½	1	3·5
+119. Lemon Bread Pudding ..	¼	135	4¾	1½	½	8·5
+120. Lemon Meringue Pudding	¼	172	6	1½	½	3
121. Lemon Soufflé	¼	55	2	½	1	5
+122. Macaroni Custard	¼	253	9	1½	1	13
+123 Marmalade Pudding ..	¼	91	3¼	2	¼	5
+124. Milk Puddings	¼	258	9	1½	1	11·5
125. Baked Milk Puddings ..	¼	152	5½	1	½	6
126. Baked Milk Puddings with egg	¼	189	6¾	1½	1	9
+127. Mincemeat	—	78	2¾	2	½	1
+128. Omelet Soufflé	¼	78	2¾	1	½	8
129. Pancakes (2)	¼	126	4½	1½	1	10
+130. Queen Pudding	¼	137	4¾	1½	½	7·5
+131. Raisin or Jam Pudding ..	⅛	69	2⅜	1½	½	3·5
132. Roly Poly	¼	47	1¾	1	1	2
+133. Sago and Apples	¼	201	7	1	0	1·5
134. Sago and Rhubarb ..	¼	165	5¾	1	0	3·5
135 Sponge Pudding, Apple ..	⅛	67	2⅜	1	½	3
136. ,, ,, Apricot ..	⅛	68	2⅜	1	½	3
+137. ,, ,, Jam ..	¼	117	4	2½	1	6
138. ,, ,, Lemon ..	⅛	50	1¾	1	½	3
139. ,, ,, Rhubarb, baked	⅛	68	2¼	1	½	3
140. Suet Dumplings (2) ..	¼	—	—	1½	1	6
141. Suet Pudding	¼	63	2¼	1	1	3
+142. Syrup Suet Pudding ..	⅛	62	2⅛	1½	½	3·5
143 Yorkshire Pudding ..	¼	127	4½	1½	1	10

The amount of food mentioned below in	Amount.	Grm.	Oz	contains CR	FR	P grm.
Cold Sweets.						
+144 Apple Trifle	½	234	6½	1½	½	6
+145. Blancmange, Chocolate ..	½	160	5½	1½	½	4
+146. ,, Cornflour ..	½	149	5¼	1	½	5·5
147. ,, Fruit ..	½	93	3¼	½	0	1
+148. Caramel Custard	½	134	4¾	1½	½	5·5
149. Cream Shape	½	110	4	½	3	5
+150. Cream of Rice	½	135	4¾	1½	1	3
151. Custard Cream	½	197	7	½	3	12
152. Fruit Cream	½	131	4¾	½	2½	4
153. Honeycomb Cream ..	½	100	3½	½	½	7·5
+154 Tapioca Cream	½	326	11½	2½	½	14
+155. Lemon Jelly	½	110	4	1	0	4
+156. ,, Snow	½	110	4	1	0	4
+157. Orange Jelly	½	88	3½	1	0	3
+158 ,, Snow	½	88	3½	1	0	3
159. Meringues (1)	⅒	37	1¼	¼	¼	0·5
+160. Prune Mould	½	114	4	1	0	4
+161. Strawberry Custard ..	½	175	6¼	1¼	¼	6
162. Summer Pudding	½	160	4¾	¾	0	0·5
+163. Trifle	½	86	3	1	1	4
+164. Trifle without cream ..	½	73	2½	1	½	4
Ice Creams.						
165. Chocolate Ice Cream ..	½	53	1¾	½	½	2·5
+166. Ice Cream using jam ..	½	115	4	1½	1	4
167. Junket Ice Cream ..	⅛	46	1½	½	¼	1·5
168. Raspberry Ice Cream ..	⅛	55	1¾	½	¼	2
169 Strawberry Ice Cream ..	⅛	52	1¾	½	1	1
170. Vanilla Ice Cream ..	½	44	1½	¼	¼	2
171. Vanilla Rich Ice Cream ..	½	62	2¼	½	1	2·5
Biscuits, Cakes.						
172. Note on Cake Making						
173. Dessert Biscuits (2) .	⅛	26	¾	1	¼	2
+174 Ginger Snaps (2)	⅛	27	1	1	¼	1
175. Ratafia Biscuits	⅛	19	¾	¼	¼	3
176. Gingerbread Sponge (3 pieces)	½	91	2¼	2	½	3·5
+177. Ginger Loaf Wholemeal ..	⅛	60	2¼	2	½	3·5
178. Oatcakes	—	32	1¼	1	½	5
179. Parkin	⅛	43	1½	1½	½	5·5
+180 Plum Cake (Mrs. Coltman's)	⅛	37	1¼	1	¼	1·5
181. Brown Rolls (2)	½	39	1½	1	0	4·5
182. Dinner Rolls (1)	½	27	1	1	0	3
183. White Rolls (2)	½	39	1½	1	0	4
+184. Shortbread .. .	½	35	1¼	1	1	2·5
+185. Sponge Cake I	½	68	2½	2½	1	5
+186 Sponge Cake II	½	63	2¼	2¼	1	5
+187. Sponge Cakes (3) ..	½	82	2¾	1½	½	6
+188. Sultana Cake	⅛	37	1¼	1	¼	1
Fruit Bottling, Jams, Jellies.						
189 Note on Fruit Bottling						
190. Note on Covering of Jams.						
+191. Apple Jam	—	35	1¼	1	0	0
+192 Apple Jelly	—	33	1¼	1	0	0
193. Apple Pulp Jam	—	53	1¾	½	0	0
+194. Apricot Jam	—	36	1¼	1	0	0
+195. Blackberry and Apple Jam or Jelly	—	34	1¼	1	0	0
+196 Blackcurrant Jam ..	—	47	1¾	1	0	0
+197. ,, Jelly ..	—	35	1¼	1	0	0

The amount of food mentioned below in	Amount.	Grm.	Oz.	contains CR	FR	P grm.
+198. Blackcurrant Pulp Jam	—	30	1¼	1	0	0
+199. Damson Jam	—	35	1¼	1	0	0
+200. Cherry Plum Jam ..	—	35	1¼	1	0	0
+201. Victoria Plum Jam ..	—	34	1¼	1	0	0
202. Lemon Curd	⅓	24	¾	½	½	1
+203. Marmalade I	—	35	1¼	1	0	0
+204. Marmalade II	—	37	1¼	1	0	0
+205. Raspberry Jam	—	33	1¼	1	0	0
+206. Red Currant Jelly ..	—	37	1¼	1	0	0
+207. Red Gooseberry Jam ..	—	36	1¼	1	0	0
+208. Rhubarb Jam	—	30	1	1	0	0
+209. Strawberry Jam I ..	—	33	1¼	1	0	0
+210. Strawberry Jam II ..	—	34	1¼	1	0	0
+211. Strawberry Jam III ..	—	33	1¼	1	0	0

RECIPES

1.—Hors d'oeuvre I. 14 grm. (½ oz) H. & P. Dinner biscuits, 32 grm (1¼ oz) mayonnaise (R. 35), 50 grm. (1¾ oz) cooked sliced carrot, 46 grm (1¾ oz) peas (cooked), 2 grm. butter, 1 hard boiled egg, lettuce and chopped parsley. Arrange all on salad or dinner plate, spread dinner biscuits with the butter, slice egg, lay on bed of lettuce, pour mayonnaise over egg, decorate with chopped parsley. Any vegetables from Class I may be used to augment or garnish this hors d'oeuvre.

2.—Hors d'oeuvre II. 28 grm. (1 oz) potato crisps, 32 grm. (1¼ oz) beetroot, 1 tomato, 1 hard boiled egg, Bovril, capers, cress Arrange all on salad or dinner plate, heat crisps and allow to cool, spread sparingly with Bovril, remove yolk from egg and mix with teaspoonful capers and few drops of caper vinegar, cut small slice from white so egg will stand, refill with yolk, lay cut portion on top, sprinkle with paprika, surround egg with cress Any vegetables from Class I may be used to augment or garnish this hors d'oeuvre.

3.—Brown Stock. Purchase 2 lb shoulder or shin of beef This should give 1¼ lb beef and bones for stock when prepared Prepare meat by wiping and removing all fat and skin, cut into pieces, wash and scrape bone, put into a strong pan with 2 quarts of water and a teaspoonful salt, bring stock slowly to boiling point, and this should take about 45 min. Remove any scum, add the following vegetables prepared and cut into pieces, 6 oz carrot, 6 oz. onion, 3 oz. turnip, 2 oz. celery, a few peppercorns Simmer stock 3 or 4 hr., add water to keep volume up to 1¼ quarts, strain through a strong sieve, allow to become quite cold, remove any fat. The stock is then ready for soups.

4.—White Stock. 2 to 2½ lb. knuckle of veal, or chicken bones and trimmings Ingredients, proportions, preparation and method of cooking are the same as for brown stock, except omit carrot and use white peppercorns only.

5.—Second or Household Stock. Into household stock put bones and meat from which first stock has been made, trimmings of cooked and uncooked meat and poultry, and bones from joints, etc., freed from fat or sauce (2 lb.), make up with water to 3 pints, add 113 grm (4 oz) of carrot, ditto onion, 85 grm. (3 oz) turnip, 57 grm. (2 oz) celery and salt and peppercorns. Bring to boiling point and skim Simmer 5 to 6 hr add more water if necessary to keep to 2½ pints, strain, when cold skim well, and use for soups, gravies, sauces. No bread, green vegetables, or starchy materials should be put into the stock pot

6.—Artichoke Soup.—This is made like Celery Soup using 1 lb. artichokes in place of celery.

7.—Bean and Tomato Soup. 219 grm. (7¾ oz) butter beans, 454 grm. (1 lb) tomatoes, 10 grm. (½ oz) dripping, salt, peppercorns, and water. Wash beans and soak overnight in 1¼ pints of water, melt dripping in soup pan, halve and fry tomatoes 5 to 10 min, add beans, salt and ¼ teaspoonful peppercorns, bring to boiling point, skim if necessary, boil gently for 3 hr, press through a coarse sieve, measure, make up quantity to 1 quart with water and re-heat. (Residue 7 oz)

8.—Celery Soup. 1 lb prepared celery, 6 oz onion, 1¼ pints white stock (R. 4), ¼ pint milk, 12 grm (½ oz.) butter or 10 grm. (½ oz) dripping, 27 grm. (1 oz) flour, salt and pepper Wash and scrape celery, cut into pieces, cut onion into slices, melt fat in soup pan, toss vegetables in it for 5 min, add stock, boil up and skim if necessary, boil gently for 1 hr, rub through a sieve, measure and return to pan, blend flour with a little milk, add thickening and remainder of milk to the celery puree, stir, boil gently for 5 min. (1 quart)

9.—Hollandaise Soup. 1¼ pints good white stock (R. 4), 32 grm. (1¼ oz.) cornflour, 4½ oz cream, 1 egg yolk, salt and pepper Bring stock to the boil, mix cornflour with a little cold stock, add to soup and cook for 5 min., season, draw pan to side of stove, stir in cream and strain in the slightly beaten egg yolk, serve with prepared garnish: add as garnish ½ oz. cooked carrot cubes, ½ oz. cooked green peas. (1 quart.)

10.—**Kidney Soup.** (i) 227 grm. (8 oz.) prepared ox kidney, fat and core removed, 27 grm. (1 oz.) flour, 10 grm. (¼ oz.) dripping, ½ pint household stock Recipe 5. (ii) 1 pint household stock, 10 grm. (¼ oz.) dripping, 57 grm. (2 oz.) each of *onion, carrot and turnip, 1 stick celery, few sprigs parsley,* ½ *teaspoonful* mixed herbs, ½ teaspoonful peppercorns, salt. (iii) 57 grm (2 oz.) grated carrot, 33 grm. (1½ oz.) flour. Method: (i) Cut kidney into small pieces, rub gently in a clean damp cloth and toss in the flour. Melt dripping in small stew pan and fry kidney pieces to a good brown colour, add stock and simmer gently for 1 hr. (ii) Melt dripping in soup pan, prepare, slice and fry vegetables for 15 min., add stock, herbs, parsley, peppercorns and salt, bring to the boil and skim, and simmer for 1 hr., strain and return to pan. Add kidney, and (iii) grated carrot, and flour mixed with a little water, cook gently for *15 min. It should measure 1 quart, if necessary add a little water to make up* soup to that quantity.

11.—*Lentil Soup. 227 grm. (8 oz.) lentils, 1 onion, 85 grm. (3 oz.) carrot, ditto turnip,* 57 grm. (2 oz.) stick celery, pepper and salt, 1½ pint stock (R. 5), ½ pint milk, 33 grm. (1½ oz.) flour, 1 grm. dripping. Wash lentils and soak overnight in the stock. Prepare vegetables and cut them in slices, melt dripping, and fry vegetables for 15 min., add lentils, stock, pepper and salt, bring to the boil, skim if necessary, simmer soup for 2 hr., stirring occasionally, when cooked, strain through sieve, return to pan, mix flour with little of the milk, add flour and milk, boil for 2 min to cook flour. (1 quart.)

12.—*Mulligatawny* Soup. 1 rabbit, 113 grm. (4 oz.) each of onion, carrot, turnip, 57 grm. (2 oz.) apple, 12 grm. (½ oz.) dripping, 28 grm (1 oz.) curry powder, teaspoonful herbs, 56 grm. (2 oz.) flour, salt, lemon juice, 1 quart brown *stock (R. 3), ½ pint water. Wash and cleanse the rabbit, cut into small* joints, chop apple finely, slice onion, melt the dripping in soup pan and fry rabbit, lift rabbit *from pan, then fry the onion, apple, curry* powder and half quantity of flour, add the meat, liquid, salt and herbs, bring to the boil and skim, simmer for 3 hr., strain through a fine sieve, and when cold skim, re-heat, add remaining flour mixed with a little water, boil soup for a few minutes to cook flour and use small pieces of rabbit as garnish, add lemon juice at last. 100 grm. rabbit in soup. (1 quart.)

13.—**Scotch Broth.** 454 grm. (1 lb.) prepared neck of mutton, 170 grm. (6 oz.) carrots (2) diced, ditto turnip (1) diced, 113 grm. (4 oz.) leeks (2) sliced, 2 dessertspoonfuls chopped parsley, 28 grm. (1 oz.) barley, 1 quart water, *salt and pepper. Trim and wipe the meat, put into pan with the water,* ½ teaspoonful salt, bring to the boil and skim thoroughly, add vegetables, barley, and seasonings, simmer slowly 3 to 4 hr. Before dishing remove mutton and add chopped parsley, measure and make up to 1 quart if necessary by adding a little water, skim if required whilst broth is cooking.

14.—**Tapioca Cream Soup.** 53 grm. (1¾ oz.) flaked or seed tapioca, 113 grm. (4 oz.) onion, 57 grm. (2 oz.) celery, 6½ oz. cream, 5 oz milk, 12 grm. (½ oz.) butter, salt and pepper, 1½ pints white stock (R. 4). Soak tapioca in the stock and boil together for ½ hr. or until tapioca is clear and cooked. Boil gently and stir occasionally as the tapioca is apt to catch. Shred the onion, cut the celery small, boil these in the cream and milk for 20 min. When the tapioca is cooked *add the strained milk, season with salt and pepper, stir in the butter* and serve very hot. (1 quart.)

15.—**Tomato Soup.** *454 grm. (1 lb.) fresh tomatoes, 170 grm. (6 oz.)* prepared onion, 113 grm. (4 oz.) prepared carrot, 57 grm. (2 oz.) prepared celery (2 sticks), 12 grm. (½ oz.) butter, 27 grm. (1 oz.) flour, 16 oz. household stock (R. 5), 10 oz. milk, salt, peppercorns. Slice onion, carrot and celery, melt fat in soup pan, toss vegetables in it for 5 min., add tomatoes, and stock, salt and peppercorns. Cook gently for 1 hr., rub through a fine sieve, measure and if necessary add a little water to make up to 1 quart including milk; blend flour with a *little milk, add thickening and remainder of milk to the soup, stir, boil gently* for 5 min. (1 quart.)

16.—**Baked Halibut.** *454 grm. (1 lb.) prepared halibut, 27 grm. (1 oz.)* white breadcrumbs, 17 grm. (½ oz.) butter, 2 oz. milk, salt and pepper. Grease a fireproof dish with some of the weighed butter, wipe fish and lay in dish, mix salt, pepper and breadcrumbs, cover fish with crumbs and shavings of butter, pour milk round fish and bake for 1 hr., baste occasionally. 482 grm. (17 oz.).

17.—**Fish Cakes.** 227 grm. (½ lb.) steamed prepared hake [or 191 grm. (6¾ oz.) haddock or 233 grm. (8¼ oz.) cod and in each case 6 grm. fat]. 240 grm. (8½ oz.) mashed potatoes (twice R. 76), 11 grm. (⅜ oz.) butter, 1 egg, pepper, salt, 25 grm. (⅞ oz.) breadcrumbs for coating. Mix fish, potatoes and seasonings well together, slightly beat egg, use half to bind mixture, reserve other half for coating fish cakes. Form into 12 cakes, weigh out 4 oz. of crumbs in a paper, egg fish cakes and dip in weighed crumbs until 25 grm. have been removed (23 grm. actually used). Fry a golden brown 8 min. (1 oz. fat taken up by cakes). 520 grm. (18¼ oz.)

18.—**Fish Pie.** 454 grm. (1 lb.) steamed hake free from skin and bones, or [382 grm. (13½ oz.) haddock, or 466 grm. (16½ oz.) cod, and in each case 6 grm. (¼ oz.) butter], 287 grm. (10 oz.) potatoes, 13 oz. milk, 14 grm. (½ oz.) butter, 13 grm. (½ oz.) flour, chopped parsley, salt and pepper. Flake fish and lay in buttered fireproof dish. Make sauce in the usual way and add a liberal supply of chopped parsley, pour the sauce over the fish. Cook and sieve potatoes, arrange over fish, smooth with a knife (1,170 grm.—41 oz.) and cook in oven for 40 min. until golden brown. 1,080 grm. (38 oz.).

19.—**Fish Pudding I.** 340 grm. (12 oz.) steamed cod or haddock, free from skin and bones, 29 grm. (1 oz.) white breadcrumbs, 20 grm. (¾ oz.) butter, 5 oz. milk, 1 egg, pepper and salt. Flake fish, put into basin with the breadcrumbs, mix well together, melt the butter and add to fish. Add egg, milk and seasonings, turn into a greased pudding bowl, cover with greased paper, and steam for ½ hr. 610 grm. (21½ oz.) Include chopped parsley in pudding if preferred.

20.—**Fish Pudding II.** 340 grm. (12 oz.) steamed hake free from skin and bone, 29 grm. (1 oz.) white breadcrumbs, 12 grm. (½ oz.) butter, 5 oz. milk, 1 egg, pepper and salt. Proceed as in Recipe 19. 600 grm. (21 oz.).

21.—**Fish Pudding II with Maitre d'Hotel Butter.** 54 grm. (1¾ oz.) Maitre d'Hotel butter, 3 times the amount in R. 34 (3 TR) are served with the amounts in R. 20. 654 grm. (23 oz.)

22.—**Fried Fish.** From 2½ lb. plaice prepare 243 grm. (8½ oz.) fillets (4). For coating use 15 grm. (½ oz.) egg (¼) and 26 grm. (1 oz.) breadcrumbs. Wipe fish, brush over with egg and toss in a paper containing 4 oz. breadcrumbs, the fish will use up a quarter of the quantity. The remainder of crumbs may be weighed to make sure proportion used is correct. Fry for 3 min. in deep fat, drain in basket and on paper, ready to serve. 255 grm. (9 oz.).

23.—**Kedgeree.** 152 (5½ oz.) steamed and prepared hake, 85 grm. (3 oz.) rice (Carolina), 16 grm. (½ oz.) butter, 2 eggs, 2 oz. milk, 1 oz. fish liquor, pepper and salt. Wash and cook rice in boiling salted water 20 min. Steam and prepare fish, boil eggs hard, chop roughly, melt butter in saucepan, add other ingredients and seasonings. Stir and cook kedgeree for 5 min. over fire, re-heating thoroughly. 557 grm. (19½ oz.).

24.—**Aspic Jelly.** 1 quart jellied veal stock (R. 4), whites and shells of 3 eggs, 57 grm. (2 oz.) onion, ditto, carrot, 27 grm. (1 oz.) celery, 1 tablespoonful vinegar, juice and rind of 1 lemon, 1 teaspoonful of salt, ½ teaspoonful pepper, 14 grm. (½ oz.) leaf gelatine, 4 cloves. Put all ingredients into a saucepan, stir with whisk until it boils, remove whisk and let froth boil up to the top of saucepan, cover, and let it stand 10 min. to clear. Dip jelly bag in boiling water, pour contents through it. (1¾ pints.)

25.—**Bread Sauce I.** 67 grm. (2½ oz.) breadcrumbs, 20 grm. (¾ oz.) butter, 85 grm. (3 oz.) onion, 13 oz. milk, salt and pepper. Cut onion up small, and boil in slightly salted water until tender, strain and return to same pan, add all other ingredients, bring slowly to boiling point, cook gently for 5 min. (18 oz.)

26.—**Bread Sauce II.** 48 grm. (1¾ oz.) breadcrumbs, 9 grm. (¼ oz.) butter, 7 oz. milk, 2 oz. onion, ½ oz. cream, 1 clove, salt and pepper. Put the milk, onion and clove into a rinsed saucepan and bring slowly to the boil, add breadcrumbs and allow to soak. When sauce is wanted, simmer gently for 5 min. Remove onion and clove, season to taste, stir in the butter and cream and serve. (11¾ oz.)

27.—**Bread Stuffing.** 78 grm. (2¾ oz.) breadcrumbs, 21 grm. (¾ oz.) butter, ¼ egg (1 oz.), 3 grm. (⅛ oz.), mixed herbs, salt and pepper. Grease a small bowl with a little of the weighed butter, rub butter into breadcrumbs, add seasonings, and mix, bind with slightly beaten egg, press into bowl and steam for 30 min. 142 grm. (5 oz.).

28.—**Brown Sauce I with Milk.** 13 grm. (½ oz) flour, 4 grm. (⅛ oz.) butter, 6½ oz. milk, good teaspoonful Bovril, salt and pepper. Blend flour with a little of the milk. Put flour, milk, butter into saucepan, stir continuously until sauce boils, add Bovril and seasonings, cook gently for 3 min. 175 grm. (6 oz.).

29.—**Brown Sauce II with Water.** 24 grm. (⅞ oz.) butter, 27 grm. (1 oz) flour, 12 oz. water, 2 good teaspoonfuls Bovril, salt, pepper. Melt butter in saucepan, add flour and mix well, add water, stir and cook gently for 5 min., add seasoning and Bovril. 367 grm. (13 oz.).

30.—**Caper Sauce.** 13 grm. (½ oz.) flour, 4 grm. (⅛ oz.) butter, 6½ oz. milk, 1 tablespoonful chopped capers, 1 teaspoonful caper vinegar. Melt butter in saucepan, add flour and milk by degrees stirring constantly and boiling up after each addition of milk, add seasonings and cook for 5 min.; add capers and vinegar, allow to boil 2 min. 199 grm. (7 oz.)

31.—**Cheese Sauce.** 14 grm. (½ oz.) flour, 40 grm. (1½ oz.) Cheddar cheese, 7 oz. milk, salt, mustard. Blend flour with a little of the milk, put flour, milk and seasonings into saucepan, stir continuously until sauce boils, cook gently for 3 min., add grated cheese, mix well. 240 grm. (8½ oz).

32.—**Curry Sauce.** 13 grm. (½ oz.) flour, 7 grm (¼ oz) Capt. White Curry powder, 12 grm. (½ oz) butter, 57 grm. (2 oz.) onion, 28 grm. (1 oz) apple, 1 teaspoonful Bovril, 10 oz. water, salt. Cut onion small and fry in the butter, add and fry chopped apple, add 5 oz. water and cook for 10 min Mix flour, curry powder and salt with remaining 5 oz. water, add to sauce and cook gently for a further 10 min. 325 grm. (11½ oz.).

33.—**Egg Sauce.** 13 grm. (½ oz.) flour, 10 grm. (⅜ oz.) butter, 6½ oz. milk, 1 hard boiled egg, salt, pepper. Make sauce, as for white sauce (R. 39), chop egg, add to sauce, allow to boil 2 min. 233 grm. (8 oz.).

34.—**Maitre d'Hotel Butter.** 12 grm. (½ oz) butter, 1½ teaspoonfuls chopped parsley, few drops lemon juice, few grains cayenne pepper. Mix ingredients together on a plate with a knife, form into two pats, set aside in a cool place to harden. Serve with fish, kidney or steak. 18 grm

35.—**Mayonnaise or Salad Dressing.** 1 egg, 13 grm. (½ oz) flour, 18 grm. (⅝ oz.) butter, 5 grm. (⅛ oz.) sugar, 10 oz. milk, 1 oz. vinegar, salt and mustard. Mix together in a bowl, whisk over pan of boiling water until mixture thickens 10-12 min. 383 grm. (13½ oz.).

36.—**Onion Sauce.** Double quantities white sauce (R. 39), 4 grm. (⅛ oz.) extra butter, 204 grm. (7¼ oz.) prepared onion, salt and pepper. Chop onion, boil in salted water until tender, strain, add to cooked white sauce, allow onion and sauce to boil together for 2 min. 570 grm (20 oz)

37.—**Tartare Sauce.** 128 grm (4½ oz.) mayonnaise, ⅓ of R. 35, 1 tablespoonful chopped capers, 1 teaspoonful caper vinegar, a dash of paprika. 154 grm. (5½ oz).

38.—**Tomato Sauce.** 453 grm. (1 lb) tomatoes, 40 grm. (1½ oz) flour, 24 grm. (⅞ oz.) butter, 7 oz. water, salt and pepper Melt butter in saucepan, cut tomatoes and fry in butter 5 min., add 5 oz water and cook gently for 30 min., press through sieve and return to pan, mix flour with 2 oz. water, add to tomatoes, season well, using paprika if available, cook gently for 5 min. 540 grm. (19 oz.). Residue weighed 53 grm. (1⅞ oz.).

39.—**White Sauce I.** 13 grm. (½ oz) flour, 4 grm. (⅛ oz) butter, 6½ oz. milk, salt, pepper. Blend flour with a little of the milk, put flour, milk and butter into saucepan, stir continuously until mixture boils. Cook gently 3 min., season. 195 grm. (7 oz.).

40.—**White Sauce II.** 34 grm. (1¼ oz) flour, 12 grm (⅜ oz) butter, 10 oz. milk, salt, pepper. Melt butter in saucepan, blend flour with a little milk, add milk and flour to saucepan, stir until sauce boils, add seasonings, cook gently 3 min. 312 grm. (11 oz.).

41.—**Apple Chutney.** 908 grm. (2 lb) apples, 103 grm. (3⅝ oz.) raisins, ditto (1 small) onion, 10 grm. (⅜ oz.) salt, 1 to 2 grm. cayenne pepper, 10 oz vinegar, 2 oz. water, 4 tablets saccharine. Shred onion finely, look over raisins, pare, core and chop apples, mix all ingredients together and boil for 20 min. 1,030 grm. (2 lb. 4½ oz.). Chutney made with saccharine evaporates readily. Use within reasonable time

42.—**Gooseberry Bar-le-duc.** 1,360 grm. (3 lb.) green gooseberries, 1,820 grm. (4 lb) sugar, 10 oz brown vinegar. Top, tail, wash and strain the gooseberries, put in a pan with the vinegar and half the sugar, simmer for 20 min., add remainder

of sugar and boil for 20 min. Serve with meat or game. 2,970 grm. (6 lb. 9 oz.).

43.—**Red Tomato Chutney.** 1,490 grm. (4 lb.) red tomatoes, 28 grm. (1 oz) each of mustard seed and salt, 2 teaspoonfuls allspice, ½ teaspoonful cayenne pepper, ½ pint white malt vinegar, 4 saccharine tablets. Peel the tomatoes, immerse in boiling water then in cold, when the skin will come off easily. Tie allspice and mustard seed in muslin and add with cayenne to the tomatoes Boil for ½ hour or until the right consistency is obtained. 1,210 grm. (3 lb 4 oz.). Remove mustard seed. Chutney made with saccharine evaporates readily. Use within reasonable time.

44.—**Arrowroot Sauce.** 12 grm (½ oz) arrowroot, 14 grm. (½ oz.) sugar, 10 oz. milk, 1 oz. sherry, brandy or any flavouring. Blend arrowroot with a little of the milk, put rest of milk into a rinsed saucepan and bring to boiling point, add arrowroot and stir until mixture boils, cook gently for 4 min., add sugar and lastly sherry. 440 grm. (15½ oz.).

45.—**Chocolate Sauce.** 12 oz. milk, 12 grm. (½ oz) arrowroot, 65 grm. (2½ oz) Cadbury's breakfast chocolate powder, 10 grm (½ oz) butter, vanilla essence. Melt butter in saucepan, mix arrowroot and chocolate powder with the milk, add to saucepan, cook gently for 5 min , add flavouring 300 grm. (13½ oz)

46.—**Custard Sauce.** 15 oz milk, 1 egg, 12 grm. (½ oz) custard powder (or 11 grm (½ oz) cornflour), 8 grm. (¼ oz) sugar, 1 saccharine tablet, 1 oz sherry [or ½ oz. brandy] as flavouring. Beat egg with a little milk and mix powder with some more of the milk, put remainder of milk into a rinsed double boiler, when hot pour over egg and custard powder stirring all the time, add other ingredients, return to double boiler, stir and cook gently 4 to 5 min until mixture thickens, add sherry to cooked sauce and stir. 468 grm. (16½ oz.).

47.—**Golden Sauce.** 142 grm. (5 oz) Lyle's golden syrup, 13 grm. (½ oz.) cornflour, 5 oz. water, 1 oz. lemon juice. Put syrup in saucepan, mix cornflour with the water and add, bring to boiling point, cook for 2 min., remove from fire, add lemon juice. 300 grm (10½ oz.).

48.—**Hard Sauce.** 42 grm. (1½ oz) sugar, 24 grm. (½ oz) butter, teaspoonful brandy, teaspoonful sherry. Beat butter and sugar to a cream, add brandy and sherry, mix well in, pile on dish and set in a cool place to harden 70 grm. (2½ oz.).

49.—**Jam Sauce.** 11 grm. (½ oz) cornflour, 107 grm. (3¾ oz) Hartley's jam (3¾ CR), 5 oz. water, 2 teaspoonfuls lemon juice, little cochineal or colouring. Mix cornflour with a little of the water, put into saucepan with remainder of water and jam, boil and cook for 2 min., add lemon juice and cochineal, if colour is poor. Strain if necessary. 245 grm. (8½ oz.).

50.—**Fruit Glaze with Gelatine for Cherry Flan.** 7 grm. (¼ oz) gelatine, 63 grm. (2¼ oz.) sugar, 192 grm. (6¾ oz) cherries without stones (1 CR), 4 oz water, 1 teaspoonful lemon juice Stew cherries in the water and sugar until tender, dissolve gelatine in a little of the fruit juice, add this to remaining juice and cherries, add lemon juice, allow to cool 356 grm. (12½ oz.). When beginning to set arrange in cold pastry case (R. 86).

51.—**Jelly Glaze.** 121 grm. (4¼ oz) red currant jelly (3 CR) or apple or other jelly. Slightly melt jelly, mix with 1 CR, fruit, as in R. 50. 300 grm. (10½ oz.). When beginning to set arrange in cold pastry case (R. 86).

52.—**Marmalade Sauce.** 11 grm. (½ oz) cornflour, 108 grm (3¾ oz) Hartley's marmalade (3¾ CR), 5 oz water, a teaspoonful lemon juice. Mix cornflour with a little water in saucepan, add rest of water, lemon juice and marmalade. Cook gently 5 min 380 grm (13½ oz)

53.—**Beef Olives.** 454 grm (1 lb) prepared steak, 89 grm (3¼ oz.) bread stuffing (½ of R. 27 uncooked), 40 grm (1½ oz) flour, 10 oz water, salt and pepper. Prepare steak by trimming off all superfluous fat and skin, weigh, cut into thin slices, flatten with rolling pin if necessary, prepare forcemeat, lay a little on each slice of meat, roll up firmly, coat the olives with seasoned flour, and pack closely in a casserole, sprinkle the remaining flour over the olives, and pour in the water, cover with a lid and cook in oven for 2½ hr Reduce heat when contents of casserole begin to simmer. 800 grm. (28 oz.).

54.—**Beef Roll or Veal Galantine.** 454 grm. (1 lb) minced steak or veal, 227 grm (½ lb) ham, 113 grm. (4 oz) breadcrumbs, 1 egg, pepper and salt. If desired add a little rind and juice of lemon and grated nutmeg for flavouring Put all ingredients into a bowl, mix well together with the hand, force into a roll,

tie tightly in a cloth and boil in stock or water for 2 hr. Re-tie cloth, press galantine, glaze when cold. 765 grm. (27 oz.).

55.—**Beefsteak and Kidney Pie.** 340 grm (¾ lb.) prepared steak, 113 grm. (¼ lb) prepared kidney, 27 grm. (1 oz) flour, salt, pepper, 3 oz. water, 150 grm. (5½ oz.) uncooked shortcrust pastry, R. 89 (½ of recipe). Remove fat and gristle from steak and cut thinly into suitable pieces for rolling, weigh and use ¾ lb. Remove fat and core from kidney, cut into pieces and rub in a clean damp cloth, weigh and use ¼ lb. Mix flour, salt and pepper, dip each piece of steak and kidney in this, roll kidney up in steak and lay in bowl for steaming, sprinkle any seasoned flour that remains over the steak, add 3 oz. water, cover securely with greaseproof paper, steam 2½ hr. 553 grm. (9½ oz.).

56.—**Beefsteak and Kidney Pudding.** The same quantities as in R. 55, but instead of pastry use 125 grm. (4½ oz) suet "cap", the amounts in R. 141. Treat the meat exactly as in R. 55. When all is prepared in bowl ready for steaming make the suet "cap" for top of pudding, lay on top of meat, cover with greaseproof paper, steam 3½ hr. 790 grm. (28 oz.)

57.—**Casserole of Stewed Steak.** 454 grm. (1 lb.) each of prepared steak, and mixed onions, carrots and turnips, 28 grm. (1 oz.) flour, 8 oz. stock (R. 5), 19 grm. (⅔ oz.) dripping, pepper and salt. Melt dripping and brown the onions, cut steak in convenient pieces, toss in the seasoned flour, arrange vegetables and meat in casserole, sprinkle over remaining flour, add the stock (42 oz.) and cook for 2½ hr. 1,080 grm. (38 oz.).

58.—**Casserole Stew with Barley.** 454 grm. (1 lb) of prepared steak and (1 lb.) mixed onions, carrots and turnips, 13 grm. (½ oz.) flour, 8 oz. household stock (R. 5), 39 grm. (1⅔ oz.) barley, 13 grm (½ oz) dripping, salt and pepper. Fry onion 20 min. add and fry carrot and turnip (last 5 min), add barley, dip meat cut in pieces in flour and seasonings, arrange all in casserole, pour in stock. Cook 2½ hr. 930 grm. (2 lb 1 oz.).

59.—**Casserole of Veal with Macaroni.** 454 grm. (1 lb) of prepared fillet of veal, and (1 lb.) mixed onion, carrot, turnip, 13 grm. (½ oz.) flour, 8 oz household stock (R. 5), 13 grm. (½ oz.) dripping, 41 grm. (1½ oz.) macaroni, salt and pepper. Melt dripping, fry onion 20 min, add and fry carrot and turnip (last 5 min.), soak macaroni and boil for a few min. in slightly salted water, cut veal in pieces, dip in flour and seasonings, arrange all in casserole, pour in stock. Cook 2¾ hr. 980 grm. (2 lb. 2½ oz).

60.—**Cheese Straws or Biscuits.** 71 grm. (2½ oz.) Cheddar cheese, 108 grm. (3¾ oz.) flour, 62 grm. (2¼ oz.) butter, 1 egg yolk, salt and cayenne pepper. Sieve flour and reserve teaspoonful for use on baking board, rub in butter, add grated cheese and seasonings, bind with yolk of egg, work with the hands until the pastry is soft (8¼ oz.), roll out and cut. Cook in moderately hot oven for 15 min. 200 grm. (7 oz).

61.—**Curry of Fresh Meat.** 454 grm. (16 oz) prepared steak, 227 grm. (8 oz.) prepared onion, 57 grm. (2 oz.) prepared apple, 28 grm. (1 oz) flour, 17 grm. (⅔ oz.) dripping, 14 grm. (½ oz.) Capt. White curry powder, 10 oz. water, salt. Melt the dripping in frying pan, slice and brown the onions; this will take 20 min. Chop the apple, add to the frying pan and cook for last 5 min. with the onion. Cut meat into cubes, mix flour, curry powder and salt on kitchen paper, toss the meat thoroughly in the flour, see every piece is coated, arrange onion and meat alternately in a casserole, sprinkle over the remaining flour, pour water over all Cook 2 hr. 850 grm. (30 oz).

62.—**Curry of Fresh Meat with Rice.** Same quantities and preparation as in R. 61. Wash 120 grm. (4¼ oz) Carolina rice and put into boiling salted water. Boil for 20 min, strain, serve with the curry. Weight of rice 288 grm. (10 oz.). Weight of whole recipe 1,140 grm (40 oz.).

63.—**Egg in Aspic.** 1 hard boiled egg, 8 oz. aspic jelly (R. 24). A few chervil or chopped pistachio nuts may be used for decoration (omitted from calculation). Melt jelly and pour a little into bottom of two rinsed moulds, allow to set, arrange any decoration that is wanted, cut egg into thin slices, lay middle slices in each mould, pour over more jelly, allow to set, and so on until egg and jelly are used. Serve with small cress. 283 grm. (10 oz.).

64.—**Curried Eggs.** 81 grm. (2⅞ oz) rice, 3 eggs, curry sauce (R. 32), 2 oz. water extra. Wash rice, put into fast boiling salted water, boil until tender, usually about 20 min. Add a little vinegar or lemon juice to the water, which keeps rice a good colour, strain. Put eggs on to boil with cold water, boil for

10 min., shell, cut off ends so that eggs will stand, chop the ends up and add to the curry sauce. Halve the eggs transversely; when arranging finally sprinkle yolks with chopped parsley. Make a border of rice on dish, pour sauce in centre, arrange eggs attractively and serve hot. Serve apple chutney with this dish. 480 grm. (22½ oz.).

65.—**Scotch Eggs.** Three eggs, 227 grm. (½ lb.) pork sausage meat (see R. 73), ½ egg and 21 grm. (¾ oz.) breadcrumbs. Boil the eggs hard, divide the sausage meat into three portions and cover each of the eggs, form into neat shapes, egg and breadcrumb, fry in deep fat for 5 min. 390 grm. (14 oz.)

66.—**Haggis.** A small sheep's pluck (2 lb 11 oz.), 170 grm. (6 oz.) each of medium oatmeal, suet, 10 grm. (¼ oz.) each of black pepper and Jamaica pepper, 30 grm. (1 oz.) salt. (If the pluck is large 8 oz. of oatmeal and 8 oz. suet will be required and more liquor.) Wash the pluck and put on to boil in 3 pints water for 1½ hr. leaving the windpipe to hang over the edge of the pot, so that any impurities may pass freely out Towards the end add a spoonful of salt extra to the amount above. Take all from the pot and allow to become quite cold Cut away all parts that seem improper, windpipe, skin, gristle, etc., grate about a third of the liver, mince the heart and lights very small (19 oz.). Dry and brown the oatmeal in the oven, mix all ingredients together, and enough of the liquor (1 pint) in which the pluck was boiled to make into a reasonably soft consistency. Divide into bowls and steam for 2 hr. when required. Serve without garnish or gravy; the haggis is sufficiently rich in itself. 1,600 grm. (3 lb. 9 oz.).

67.—**Irish Stew.** 454 grm (1 lb.) prepared neck of mutton chops with bones, 227 grm. (8 oz.) prepared onion, 340 grm. (12 oz.) prepared potatoes, 5 oz. water, 8 grm (¼ oz.) dripping, salt and pepper. Melt dripping in a stew pan, slice and brown the onion, brown the chops, add potatoes thickly sliced, seasonings, and 5 oz. water. Shake pan occasionally during cooking, but on no account lift the lid, cook for 1½ hr 1,050 grm (2 lb. 5 oz.)

68.—**Macaroni Cheese.** 54 grm. (1¾ oz.) macaroni, 62 grm (2¼ oz.) Cheddar cheese, white sauce R 39, mustard and salt Soak macaroni in water for 1 hr., boil in salted water until tender Prepare sauce, add macaroni and ¾ of the grated cheese, season well with salt and mustard, transfer to rinsed pudding dish, sprinkle remainder of cheese on top of pudding, brown in oven 45 min. 420 grm. (15 oz.)

69.—**Mushrooms on Toast.** 100 grm. (3½ oz.) prepared mushrooms, 38 grm (1¼ oz.) bread, 18 grm (¾ oz.) butter Toast bread, lay prepared mushrooms on a baking tray, put a piece of butter on each, grill, arrange mushrooms on the toast, pour any juice that may have collected over, also add a few drops of lemon juice. Serve very hot 113 grm. (4 oz.).

70.—**Omelet.** 2 fresh eggs, 12 grm. (½ oz.) butter, salt and pepper. Break eggs into a basin, add salt and pepper and mix, melt the butter and allow to run over omelet pan, and pour superfluous butter into egg basin and mix. Pour mixture into pan, stir, and keep pan moving to and fro over the heat Allow to settle, cook until underside is light brown and upper surface is nearly set. Should take 4 min. 100 grm (3½ oz.).

71.—**Omelet with Cream.** 2 fresh eggs, 24 grm (¾ oz.) butter, ½ oz cream, salt and pepper, 6 grm (¼ oz.) butter for pan Melt the butter in a bowl and allow to cool, add the eggs, cream and seasonings, beat to a smooth cream, melt 6 grm butter in frying pan, see pan is just wet, pour in the mixture, stir and keep pan moving to and fro over the heat Allow to settle, until underside is light brown, and upper surface is nearly set, fold over, serve immediately. Should take 3 to 4 min to cook. 127 grm (4½ oz.).

72.—**Pork Hot Pot.** 342 grm (12 oz.) lean prepared pork, 227 grm. (8 oz.) prepared onion, 57 grm. (2 oz.) prepared apple, 17 grm (½ oz.) flour, 14 grm. (½ oz.) dripping, 228 grm. (8 oz.) prepared potatoes, 8 oz. household stock (R 5), teaspoonful sago, salt and pepper Melt dripping, slice and fry onion 20 min. Slice half quantity of potato and put into bottom of casserole, keep even slices for top, mix flour with sage and seasonings; cut pork into suitable pieces, toss in seasonings, arrange layers of onion, apple, pork on potato bed, top with overlapping potato slices, sprinkle any seasonings that is left over potato, add stock. 1,160 grm. (41 oz.) Cook 2½ hr. 1,020 grm (36 oz.).

73.—**Pork Sausages** (a) boiled Composition of sausages: 25 per cent bread, 75 per cent pork (¾ of which is lean, ¼ fat). Prick 155 grm. (5½ oz.) of the sausages,

put in water. Bring water to boil and simmer gently 10 min. (b) fried. Prick same amount of sausages and fry gently 10 min.

74.—Potato Chips. Cut 208 grm. (7½ oz.) potatoes into blocks; an average potato makes 15 chips. Prepare and cook as for potato crisps, but allow 4 min. in fat for first cooking, 3 min. second cooking. 84 grm. (3 oz).

75.—Potato Crisps. 208 grm. (7½ oz.) potatoes, 340 grm. (12 oz) dripping. Slice peeled potatoes very thinly, allow to lie in cold water for 30 min., drain and dry on a clean cloth. Lay potatoes in frying basket and plunge into smoking hot fat for 3 min, lift basket, re-heat fat, cook again 3 min., repeat if crisps are not browned, drain on paper, sprinkle with salt. 77 grm. (2¾ oz.).

76.—Potatoes (mashed). Boil 200 grm. (7 oz.) peeled old potatoes in salted water until tender, pour off water and steam slightly to finish cooking. Cooked like this there is no alteration of weight. Mash with 1 oz. milk, 12 grm. (½ oz.) butter, add pepper. 240 grm (8½ oz.).

77.—Savoury Buns. *Choux Pastry, unsweetened.* 80 grm. (2¾ oz.) flour, 48 grm. (1¾ oz.) butter, 2 eggs, 5 oz. milk, salt. Proceed as R. 81. 329 grm. (11½ oz.). Prepare 12 buns, scoop out and neglect soft dough, amount removed 82 grm. (2¾ oz). 247 grm. (8¾ oz.). *Egg filling.* 97 grm. (3½ oz.) white sauce No. I (R. 39), 3 hard boiled eggs. Chop eggs and mix with sauce. Fill 12 buns with cold savoury mixture 510 grm. (18 oz).

78.—Savoury Pudding. 57 grm (2 oz) white breadcrumbs, 16 grm. (½ oz.) butter, 2 eggs, 7 oz. milk, 1 medium size onion, mixed herbs or chopped parsley, pepper and salt. Shred onion and boil in salted water until tender, beat eggs, mix ingredients together and season well with herbs, pepper and salt, butter dish and bake for 40 to 50 min. 420 grm. (15 oz).

79.—Stewed Sausages. 340 grm. (12 oz) pork sausages, 227 grm. (8 oz) tomatoes, 170 grm. (6 oz.) onion, 6 grm. (¼ oz.) dripping, 5 oz stock (R. 5), salt and pepper. Put dripping in stew pan, and brown the sliced onion for 15 to 20 min., add stock and seasoning, prick sausages, lay them on the onions, halve or cut tomatoes in thick slices, lay on top of sausages, cook gently for ¾ hr. 780 grm. (27½ oz).

80.—Stewed Tripe and Onions. 908 grm. (2 lb) cleaned and partly cooked tripe, 340 grm. (12 oz) (2 good sized) onions for sauce, 610 grm. (17½ oz.) (double quantities) of sauce (R. 39), salt, pepper Cut tripe into suitable pieces, put in pan with plenty of water, bring to the boil, change the water if necessary, simmer for 1 hr. or until thoroughly tender. Boil onions for 1 hr. or until cooked, strain tripe and onions. Prepare sauce, add the strained tripe and onions to the sauce, bring to boiling point and simmer all together for 10 to 15 min. 1,300 grm. (2 lb 14 oz).

81.—Choux Pastry. 80 grm (2¾ oz.) flour, 48 grm. (1¾ oz) butter, 14 grm (½ oz.) sugar, 5 oz. milk, 2 eggs, a pinch of salt. Prepare baking tray, warm and grease with 2 grm. of the weighed butter, bring butter and milk to the boil, add sugar and sifted flour, stir until smooth and the mixture leaves the side of the pan, separate eggs, add yolks a little at a time, beat well, add stiffly beaten whites. 357 grm. (12½ oz). Place 16 spoonfuls or fingers of mixture on prepared tray, start in a fairly hot oven so that buns rise well, reduce heat and continue to cook in all 40 min. Allow to cool. 240 grm (8½ oz.). Split, scoop out soft dough, amount removed 70 grm. (2½ oz.). Final weight, 170 grm. (6 oz.).

82.—Cream Buns. Fill the Choux pastry buns with the sweetened and flavoured whipped cream [200 grm. (7 oz.) by weight, cream, 21 grm. (¾ oz.) sugar, vanilla essence used for filling], 16 buns. 390 grm. (13¾ oz.).

83.—Flaky Pastry. 216 grm. (7¾ oz), flour, 192 grm. (6¾ oz) butter, 4½ oz. water, containing 1 teaspoonful lemon juice, pinch salt. Sieve flour and salt, reserve a large spoonful flour for use on baking board, cut up the butter walnut size, drop into flour, add water and lemon juice, form quickly into a soft dough, turn out on to baking board, roll into a strip, fold in three, half turn and roll out again. Continue this three times, if possible stand in a cold place for an hour or two before using. 525 grm. (18½ oz).

84.—Lemon Cheese Slices. 66 grm. (2¼ oz.) uncooked flaky pastry, 48 grm. (1¾ oz.) lemon curd (R. 202). Roll pastry out, cut four fingers weighing in all 66 grm. Cook for 10 min. in very hot oven. Cool, and spread with the lemon curd. 94 grm. (3¼ oz).

85.—**Mince Pies with Cream.** 66 grm. (2½ oz.) uncooked flaky pastry, 73 grm. (2½ oz.) mincemeat (R. 127). Roll pastry out thinly, cut 4 rounds of pastry weighing 66 grm. in all. Divide mincemeat and lay on two of the pastry rounds, damp edges and cover with the remaining pastry, slit on top, seal edges. Cook the two pies in hot oven 15 min. Serve with 21 grm. (¾ oz. by volume) cream. 135 grm. (4¾ oz.).

86.—**Flan Pastry.** 176 grm. (6¼ oz.) flour, 90 grm. (3¼ oz.) butter, 32 grm. (1¼ oz.) sugar, 1 egg yolk, salt. Sieve flour and salt reserving small spoonful flour for use on baking board, add sugar, rub in the butter, mix with the yolk of egg and work with the hands until the pastry is soft, add a few drops of water if necessary, roll out at once, line flan cases or plates. 296 grm. (10½ oz.) Cook 20 min. 240 grm. (8½ oz.).

87.—**Chester Tart.** 148 grm. (5¼ oz.) uncooked flan pastry (½ R. 86). Chester filling. 24 grm. (¾ oz.) butter, 38 grm. (1¼ oz.) sugar, 46 grm. (1¾ oz.) ground almonds, 1 egg, pinch salt, ½ lemon rind and juice. Line a 6-inch plate with flan pastry, cream butter and half the amount of sugar, add yolk of egg, ground almonds, lemon rind and juice, spread over pastry case and cook in a hot oven for 20 min. Cool slightly, whip white of egg stiffly, add remainder of sugar, arrange meringue on top of tart and return to oven to brown 10-12 min. 295 grm. (10½ oz.).

88.—**Orange Tart.** 148 grm. (5¼ oz.) uncooked flan pastry (½ R. 86). Orange filling. 60 grm. (2¼ oz.) grated breadcrumbs, 1 egg, 40 grm. (1½ oz.) sugar, 18 grm. (¾ oz.) butter, grated rind of one orange, 5 oz. orange juice, 1 egg, pinch salt. Line a 6-inch plate with flan pastry. Cream butter and half quantity of sugar, add breadcrumbs, grated rind, yolk of egg and orange juice, pour into pastry case and cook in a hot oven for 20 min. Cool slightly, whip white of egg, add remainder of sugar, arrange meringue on top of tart and return to oven to brown 10-15 min. 415 grm. (13¾-14¾ oz.).

89.—**Shortcrust.** 216 grm. (7¾ oz.) flour, 4 grm. (¼ oz.) Royal baking powder, 144 grm. (5 oz.) butter, 1½ oz. water, pinch salt (120 grm. (5¾ oz.) lard may be used instead of butter). Sieve flour, baking powder and salt, reserve spoonful flour for use on baking board, rub in butter, mix with water, roll out. 397 grm. (14 oz.) Bake in hot oven 12 min. 326 grm. (11½ oz.).

90.—**Apple (or Fruit) Pie.** 198 grm. (7 oz.) uncooked shortcrust pastry (¼ quantities of R. 89), 456 grm. (16 oz.) prepared apple (or 2 CR other fruit), 2 saccharine tablets, 2 oz. water. Prepare, slice and weigh apples, arrange in pie dish, add 2 saccharine tablets and 2 oz. water, 2 cloves if liked, damp edges of dish, cover with pastry, press edges firmly down, cut off any overhanging pastry, knock up edges with knife, flute with fingers and knife, use left over pastry for top decoration, arrange leaves or whatever decoration has been made round slit on top of pie. Cook 20 min. in hot oven until fruit is cooked. 662 grm. (23 oz.).

91.—**Apple Tart (individual).** 50 grm. (1¾ oz.) uncooked shortcrust pastry (R. 89), 57 grm. (2 oz.) prepared apple, 5 grm. (¼ oz.) sugar, ½ oz. of water. Use individual pie dish, put in half quantity of apple, add sugar and water, add remainder of apple, proceed as for Apple Pie (R. 90). Cook 10 min. in hot oven, further 15 min. in cooler part of oven, or reduce heat, until fruit is cooked. 114 grm. (4 oz.).

92.—**Jam Tartlet or Puff.** 50 grm. (1¾ oz.) shortcrust pastry (R. 89), 18 grm. (¾ oz.) red gooseberry jam. Roll pastry out, cut 2 rounds weighing 5 grm., lay jam on one, damp edges, cover with the other round of pastry, seal and knock up edges, cut top, cook in moderately hot oven 10 min. 68 grm. (2¾ oz.).

93.—**Lemon Cheese Tart.** 150 grm. (5¼ oz.) uncooked shortcrust pastry (R. 89). Line a teaplate with the pastry, reserving 4 small strips of pastry for criss-cross and fill with 72 grm. (2½ oz.) lemon curd (R. 202). Bake for 15 min. 205 grm. (7¼ oz.).

94.—**Mincemeat Tartlet.** 50 grm. (1¾ oz.) uncooked shortcrust pastry (R. 89). Divide pastry into two and lay it on two patty pans reserving a little for fine criss-cross, fill tarts with 78 grm. (2¾ oz.) mincemeat (R. 127) divided into 2 parts. Bake 15 min. Two tartlets. 115 grm. (4 oz.).

95.—**Wholemeal Shortcrust.** 58 grm. (2 oz.) white flour, 163 grm. (5¾ oz.) wholemeal flour, 96 grm. (3¼ oz.) butter, 4 grm. (¼ oz.) Royal baking powder, 2 oz. water. Sieve white flour and reserve a dessertspoonful for use on baking board, mix flour, wholemeal flour and salt, rub in butter, add baking powder

and water, roll out. 378 grm. (13½ oz). This amount makes 2 large plate tarts. Cook for 15 min. 296 grm. (10½ oz.). Best eaten hot.

96—Apple Tart (individual). Use 47 grm. (1⅝ oz.) uncooked wholemeal pastry (R. 95) and proceed as for R. 91. 111 grm. (3⅞ oz.).

97.—Golden Syrup Tart. Use 94 grm. (3⅓ oz.) unbaked wholemeal shortcrust (R. 95), line teaplate with pastry, reserve 4 small strips of pastry for criss-cross, use 47 grm. (1⅝ oz) golden syrup and 9 grm. (¼ oz.) breadcrumbs for filling, bake for 15 min. 140 grm. (5 oz.).

98.—Jam Plate Tart. 94 grm. (3⅓ oz.) wholemeal pastry (R. 95), 72 grm. (2½ oz.) gooseberry jam, or other (2 CR). Roll pastry out and line a teaplate, use any pastry over for decoration. Spread with jam, decorate and cook in moderately hot oven for 15 min. 150 grm. (5⅓ oz.).

99—Mincemeat Tart. Take 94 grm. (3⅓ oz.) uncooked wholemeal pastry (R. 95), line a teaplate with the pastry, reserve 4 small strips of pastry for criss-cross, and fill with 156 grm. (5½ oz.) mincemeat (R. 127). Bake for 15 min. 227 grm. (8 oz.).

100—Apple Charlotte. 252 grm. (9 oz.) prepared apple, 1 saccharine tablet, 2 oz. water, 57 grm. (2 oz.) breadcrumbs, 10 grm. (⅓ oz.) demerara sugar, 18 grm. (⅔ oz.) butter, 3 grm. cinnamon Stew apples with saccharine and water until tender, beat, pour into pie dish. Have breadcrumbs prepared mixed with sugar and cinnamon, lay on top of apples immediately, shred butter over breadcrumbs and brown under grill or in hot oven. Cinnamon may be omitted, grated lemon used instead. 368 grm (12½ oz.).

101.—Batter, baked. 69 grm. (2½ oz.) flour, 1 egg, 6 oz milk, pinch salt, 11 grm. (⅓ oz.) butter for pudding dish. Sieve flour and salt, beat in egg and milk, cover and allow to stand, beat occasionally, melt butter in pudding dish, give batter a final beating, pour into dish and bake 40 min. in a good oven. 227 grm. (8 oz.).

102—Batter, steamed. Batter recipe and method No. 101. Melt butter in a roomy steaming basin, pour batter in, cover with greaseproof paper, steam gently for 1 hr. Serve immediately. 283 grm (10 oz.)

103—Batter, Apple. 114 grm. (4 oz.) prepared cooking apple, 56 grm. (2 oz) flour, 1 egg, 6 oz. milk, 12 grm. (½ oz.) butter, pinch salt. Mix flour, salt, egg and milk, beat, cover, allow to stand, melt butter in dish, slice apples thinly into this, give batter final beating, pour over apples and cook in a good oven 40 min. 278 grm. (13 oz.).

104—Batter, Red Currant. 255 grm. (9 oz.) red currants, 21 grm. (¾ oz.) sugar, batter (R. 101). Prepare batter and allow to stand 1 or 2 hr., butter dish sparingly, reserving remainder of butter for top of pudding. Pick and look over currants, put them in the dish, give the batter a final beating and pour over currants, bake in hot oven for 40 min ; after 20 min. cooking sprinkle the sugar over and dot the butter on top, allow to finish cooking. 550 grm. (19½ oz.).

105.—Bread and Butter Pudding. 57 grm. (2 oz) white bread, 6 grm. (⅛ oz) butter, 1 egg, 25 grm. (⅞ oz) sultanas, 10 oz. milk. Rinse pudding dish, cut bread in slices or fingers, spread with the butter, arrange alternately in dish with sultanas, a layer of buttered bread to be on top, beat egg, add milk, pour over pudding, and allow to soak for at least 1 hr. Cook 2 hr. in slow oven. 387 grm. (13⅔ oz.).

106—Canary Pudding. 114 grm. (4 oz.) flour, 59 grm. (2⅛ oz) butter, 57 grm. (2 oz) sugar, 4 grm. (⅛ oz.) baking powder, 2 eggs, 1 oz milk, pinch salt, grated rind of 1 lemon. Reserve a little butter to grease pudding bowl, cream butter and sugar, sieve flour and baking powder, separate eggs, add yolks and flour alternately to the creamed butter and sugar, add pinch salt to whites, whisk to a stiff froth, and add to pudding mixture, pour into prepared bowl, cover with greaseproof paper, steam 1 hr. 150 grm. (12½ oz.).

107.—Canary Puddings. Prepare mixture for Canary pudding (R. 106), warm and lightly grease 7 moulds with a little of the weighed butter, put ½ CR jam (apricot used) in each mould and divide pudding mixture; each pudding 69 grm. (2½ oz). Steam 30 min. Each pudding 72 grm. (2½ oz.).

108.—Chocolate Pudding. 100 grm. (3⅔ oz) breadcrumbs, 85 grm. (3 oz) Cadbury's breakfast chocolate, 37 grm. (1⅓ oz.) sugar, 2 eggs, 18 oz. milk, a little vanilla essence, 2 grm. (1/16 oz.) butter for dish. Dissolve chocolate in a little of the milk, mix breadcrumbs, milk, chocolate, yolks, and half amount of sugar well

together, heat pie dish and grease with butter, pour pudding into dish and bake until set in oven 1 hr., allow to cool. 850 grm. (1 lb 14 oz). Whisk whites stiffly, beat in remaining sugar, or dredge over whites when arranged on pudding, return to cool oven to brown meringue for 20 min. 908 grm (2 lbs).

109—**Christmas Pudding.** 214 grm. (7½ oz.) sugar, 190 grm. (6¾ oz) beef suet, 113 grm. (4 oz.) each of flour, breadcrumbs and mixed candied peel, 275 grm. (9¾ oz.) each of currants, sultanas and raisins, 57 grm. (2 oz) almonds, ½ teaspoonful salt, ½ teaspoonful grated nutmeg, grated rind of 1 lemon, 3 eggs, 5 oz. milk, 1 wineglass brandy (1 grm butter for bowl). Prepare and mix all dry ingredients, beat well and stir in the eggs, add milk and brandy Cover and leave in basin overnight. Mix again following day, divide into 4 pudding bowls and steam for 6 hours. 2,014 grm. (4 lb. 7 oz.).

110—**Currant Dumpling.** 223 grm. (7¾ oz.) self-raising flour, 100 grm. (3½ oz.) Atora suet, 185 grm. (6½ oz.) currants and sultanas mixed, 8 oz. milk, a pinch salt, 4 grm. (⅛ oz) butter for greasing bowl Prepare bowl, sieve flour and salt, add fruit and milk, pour into prepared bowl, cover with greaseproof paper and steam for 2 hr. 704 grm. (25¼ oz.) Or boil in cloth Use 210 grm. (7 oz) self-raising flour for pudding and 13 grm. (½ oz) plain flour for pudding cloth.

111.—**Custard Blancmange.** 1 pint of milk, 1 egg, 18 grm (¾ oz) custard powder (or 17 grm. (⅝ oz) cornflour), 5 grm. (¾ oz.) sugar, vanilla flavouring Beat egg with a little milk, and mix powder with some more of the milk, put remainder of milk into a rinsed double boiler, when hot pour over egg and custard powder stirring all the time, add other ingredients, return to double boiler, stir and cook gently 4 to 5 min. until mixture thickens 620 grm (22 oz.).

112.—**Custard, with Custard Powder.** 10 oz. milk, 18 grm. (¾ oz) custard powder, pinch salt, 1 saccharine tablet, flavouring if required. Mix custard powder with a little milk, put the remainder on to boil in a rinsed pan, pour over custard powder stirring all the time, return to pan, boil 1 min 295 grm (10¾ oz).

113—**Custard Pudding, baked.** 10 oz milk, 1 egg, 5 grm. (1/8 oz.) sugar, pinch of salt, flavouring Beat egg and milk, add sugar, salt and flavouring, pour into rinsed pudding dish, set dish in tray of water, cook 1 hr. in slow oven. 330 grm. (11½ oz).

114—**Custard Pudding, steamed.** Same ingredients as R. 113. Beat egg and milk, add other ingredients, pour into a rinsed basin, cover with greaseproof paper, steam gently for 1 hr, stand basin on a ring in pan to prevent it coming in contact with the boiling water 350 grm. (12¼ oz).

115.—**Cup Custard.** The same recipe as for custard sauce (R. 46). Pour into 4 cups.

116—**Fruit Dumpling, steamed.** 323 grm. (11¼ oz) prepared green gooseberries (½ CR), 10 grm (¼ oz) sugar, 1 oz water, suet crust R. 141. Put fruit, sugar and water into steaming bowl, top with suet crust, cover with greaseproof paper, and steam for 1 hr 485 grm. (17 oz) If 1 CR fruit is used omit sugar adding 1 or 2 saccharine tablets instead.

117.—**Fruit Dumpling, baked.** Use same ingredients and method as in R 116, do not cover with paper, bake in oven 40 min. 451 grm. (16 oz).

118—**Jam Layer Pudding, steamed.** 147 grm (5¼ oz) flour, 66 grm. (2¼ oz) Atora suet, 12 grm (½ oz) baking powder, 4½ oz milk, pinch salt, 141 grm. (5 oz) black currant jam (3 CR). Warm a pudding basin and grease lightly with 1 grm. butter; sieve flour, salt and baking powder into a basin, add suet and moisten with the milk, use a knife for this purpose, arrange a layer of suet crust in prepared basin, spread half the amount of jam on this, then a second layer of crust then jam, and a final layer of suet crust, cover with greaseproof paper and steam for 1½ hr 492 grm. (17½ oz)

119—**Lemon Bread Pudding.** 136 grm (4¾ oz) breadcrumbs, 52 grm. (1¾ oz) sugar, 19 oz. milk, 2 eggs, pinch salt, 1 lemon rind and juice, 1 grm. butter for dish. Grate and weigh breadcrumbs, add milk, egg yolks, rind of lemon, juice of ½ lemon, ½ quantity of sugar, mix Warm and grease pie dish, pour mixture into dish and cook gently for 1 hr until set, remove from oven, cool slightly, whisk whites stiffly, add remaining sugar and lemon juice, arrange meringue on top of pudding, return to oven to brown. 813 grm (28¾ oz.).

120.—**Lemon Meringue Pudding.** 57 grm. (2 oz.) arrowroot, 68 grm. (2½ oz.) castor sugar, 12 grm. (½ oz.) butter, 2 eggs, pinch salt, 1 pint boiling water, 2 lemons, rind and juice. Prepare pudding dish by greasing dish with a little of the weighed butter, separate yolks and whites Reserve 2 tablespoonfuls of sugar for meringue, beat remainder of sugar with the yolks, add juice and grated rind of lemons, sifted arrowroot and butter, pour on boiling water, stir all the time until smooth, put into pan and stir over fire until mixture thickens, pour into prepared pudding dish. Whip up whites stiffly, fold in sugar, arrange on top of pudding, brown in cool oven. Eat hot or cold. 668 grm. (24 oz.).

121.—**Lemon Soufflé.** 28 grm. (1 oz.) butter, 23 grm. (¾ oz) each of sugar and flour, 3 eggs, grated rind of 1 lemon, a little juice, 1 oz milk. Grease an oven glass or soufflé dish with some of the butter, grease and tie round a double band of kitchen paper, to form a collar round the dish. Melt the butter, add flour and milk, stir and cook for a few minutes, add the sugar and lemon, cool, add yolks one at a time beating well, whip whites stiffly, add pinch salt and egg mixture to whites, stir together carefully with a metal spoon, pour into soufflé dish, cover with a piece of greased paper and bake in moderate oven for 40 min. 219 grm. (7¾ oz.).

122.—**Macaroni Custard.** 57 grm (2 oz.) macaroni, 25 oz milk, 1 egg, 10 grm. (½ oz.) sugar, salt. Soak macaroni in 20 oz milk for 1 hr., put into saucepan and cook gently until macaroni is soft and swollen Beat egg with pinch salt, sugar and 5 oz milk. Put all into rinsed pudding dish, set in tray of water, cook in slow oven for 1¼ hr 760 grm. (27 oz)

123.—**Marmalade Pudding.** 107 grm. (3¾ oz) breadcrumbs, 11 grm. (⅜ oz) Atora suet, 1 egg, pinch of salt, 3 oz milk, grated rind of 1 lemon, 93 grm (3¼ oz.) Hartley's marmalade (3 CR). Warm and grease a steaming bowl with 1 grm butter, mix breadcrumbs, suet and lemon rind, add marmalade, beaten egg and milk, mix well, turn into prepared bowl and steam 1½ hr. 365 grm. (13 oz).

124.—**Boiled Milk Pudding.** 32 grm (1⅛ oz) arrowroot [or 35 grm. (1¼ oz) cornflour, 38 grm. (1⅜ oz) flaked rice, 35 grm. (1¼ oz) flaked tapioca, 39 grm. (1⅜ oz) small sago, 38 grm. (1⅜ oz) ground rice], 20 oz. milk, 1 saccharine tablet, pinch of salt. Blend cereal with a little milk, put rest in saucepan to boil, add cereal, saccharine and salt, and cook gently for 15 min ; flavouring if required. Ground Rice pudding. 516 grm. (18 oz).

125.—**Baked Milk Pudding, plain.** (a) 70 grm. (2½ oz) rice (weighed, then washed) [or 57 grm. (2 oz) flaked tapioca], 20 oz. milk, pinch of salt, 1 saccharine tablet, flavouring if liked ; (b) 52 grm. (1⅞ oz) sago [or 50 grm. (1¾ oz) flaked rice or 2 CR of other cereals], 10 grm (⅜ oz.) sugar, 20 oz. milk, pinch of salt. Rinse pudding dish, add ingredients, cook in moderately slow oven for 2½ hr., stir occasionally before skin has formed on top of pudding For rice, wash rice, prepare pudding and allow to stand for at least an hour before putting into oven. These puddings lose 1 oz. in weight during cooking. Rice pudding. 607 grm (21⅜ oz).

126.—**Baked Milk Pudding, with egg.** (a) 52 grm. (1⅞ oz) arrowroot [or 57 grm. (2 oz) flaked tapioca], 20 oz. milk, 6 grm. (⅛ oz.) butter, 1 egg, 10 grm. (⅜ oz.) sugar, pinch of salt ; (b) 47 grm. (1⅝ oz.) cornflour [or 57 grm. (2 oz.) macaroni, 60 grm. (2⅛ oz) rice (weighed, then washed), 53 grm. (1⅞ oz) flaked rice, 53 grm. (1⅞ oz.) ground rice, 55 grm. (2 oz.) sago], 25 oz. milk, 1 egg, 10 grm. (⅜ oz) sugar, salt. Blend finer cereals with a little milk [sprinkle grained cereals into hot milk, soak large grained cereals such as rice and macaroni in the milk for an hour before boiling]. For arrowroot mix with a little milk, put rest of milk in saucepan to boil, add arrowroot and stir briskly, cook cereal and milk gently for 5 min., add butter and sugar and allow to cool, add yolk of egg, a little at a time and mix, whip white of egg stiffly, and fold into mixture, pour into a rinsed pudding dish, set dish in tray of water, cook in slow oven for 1¼ hr. until pudding is lightly risen and brown. Arrowroot pudding. 567 grm. (20 oz.).

127.—**Mincemeat.** 825 grm. (29 oz) currants, 550 grm. (19¼ oz.) Valencia raisins, 454 grm. (1 lb) prepared apples, 113 grm. (4 oz.) each of mixed peel, almonds, Atora suet, 57 grm. (2 oz.) citron peel, 340 grm. (12 oz.) Demerara sugar, 5 grm. (1 teaspoonful) each of cinnamon, allspice, rind of 1 lemon, 2 oz. lemon juice, 1 oz. sherry. See that all fruit is cleaned and stoned, chop the following

separately: raisins, apples, mixed peel, citron peel, grate lemon rind; shred almonds. Mix all ingredients well together, cover and leave in bowl overnight. Following day mix again, put into jars, cover securely. 2,590 grm. (5 lb 11 oz.).

128.—Omelet Soufflé. 3 whites of egg, 2 yolks, 21 grm. (¾ oz.) sugar, 1 CR of tart jam or jelly, vanilla or other flavouring. Butter a fireproof dish and spread jam or jelly in bottom of it. Whisk the yolks and sugar in a bowl over a pan of boiling water until thick and creamy, remove bowl from pan, stir in a few drops of vanilla, add pinch of salt to whites and whisk them to a stiff froth, fold lightly into the yolks, pile on top of jelly and bake in a hot oven for 10 min., or until lightly brown and just set, serve immediately. 156 grm. (5½ oz).

129.—Pancakes. Use batter mixture of R. 101. Sieve flour and salt, beat in egg and milk, allow to stand, beat occasionally. Heat omelet pan, hold butter in a piece of greaseproof paper, grease bottom and sides of pan, pour in sufficient batter to cover bottom of pan, brown both sides. Repeat 3 or 4 times according to size of pan. Make 4 pancakes. Pile one on top of the other, keep hot until required 252 grm. (9 oz).

130.—Queen Pudding. 107 grm. (3¾ oz) breadcrumbs, 37 grm. (1¼ oz.) sugar, 19 oz. milk, 2 eggs, lemon rind and juice, 93 grm (3¼ oz) Hartley's raspberry jam (3 CR). Mix breadcrumbs, half of sugar, milk, grated lemon rind, and yolks well together Warm and grease a pie dish with 1 grm butter, pour into pie dish and allow to cook gently for 1 hr. until pudding has set, remove from oven and allow to cool (652 grm., 22 oz.), spread jam over pudding, whisk whites stiffly, add a little lemon juice and remaining sugar, and arrange on top of pudding, return to oven to brown 20 min. 824 grm. (29 oz).

131.—Raisin (or Jam) Pudding. 195 grm. (6¾ oz) self-raising flour, 47 grm (1¼ oz.) Atora suet, 61 grm (1¼ oz.) sugar, 1 egg, 5 oz milk, 153 grm. (5¼ oz) raisins (or 4½ CR jam). Warm steaming bowl and lightly grease with 1 grm. butter, sieve flour, add suet, sugar and pinch of salt, mix raisins with dry ingredients, add beaten egg and milk, lift into prepared bowl, and steam for 2 hr 673 grm. (23¾ oz) Alternatively omit raisins and put jam in bottom of bowl after greasing

132.—Roly Poly. 156 grm (5½ oz) flour, 65 grm. (2¼ oz.) Atora suet, 14 grm. (½ oz) baking powder, 3½ oz. water, salt, 141 grm. (3 CR) black currant jam, 33 grm. (1¼ oz.) flour for cloth. Sieve flour, salt and baking powder, reserve dessertspoonful flour for use on baking board, add water, roll out to suitable size, spread jam equally over centre, leaving an inch of suet pastry all round, dampen edges, fold up, press down and tuck in edges. Dip pudding cloth in boiling water, wring out flour cloth well, roll pudding up, tie ends, put into fast boiling water and boil 1 hr Weight of pudding as served 418 grm (14¾ oz) (64 grm (2¼ oz.) wasted on cloth allowed for in calculation.)

133.—Sago and Apples. 52 grm. (1¾ oz.) sago, 456 grm. (16 oz) cooking apples, peeled and cored, 4 saccharine tablets, cooking sherry or lemon juice, water, 1 pint in all. Prepare apples, slice, rinse pudding dish, put in apples, sago, saccharine tablets, pour liquid over, allow to stand. Cook in a moderate oven for an hour 806 grm. (28¼ oz.).

134.—Sago and Rhubarb. 52 grm. (1¾ oz.) sago, 454 grm. (1 lb) prepared rhubarb, 4 saccharine tablets, ½ oz. cooking sherry or lemon juice, water to make 15 oz. liquid in all Wash sago, rinse pudding dish, put in all ingredients, allow to stand—965 grm. (34 oz)—and cook for 1 hr in moderate oven. 822 grm (29 oz.)

135.—Sponge Pudding, Apple. 190 grm (6¾ oz) self-raising flour, 48 grm. (1¾ oz) butter, 57 grm. (2 oz) sugar, 1 egg, 3 oz milk, 228 grm (8 oz) prepared cooking apple (1 CR) Grease pudding basin with a little of the weighed butter, line with sliced apple, sieve flour, add sugar, rub in butter, beat egg, add egg and milk and any flavouring, pour mixture on top of apples, cover basin with greaseproof paper, steam 1 hr. 694 grm. (24¾ oz).

136.—Sponge Pudding, Apricot. Sponge recipe (R. 135) substituting for apples 324 grm. (11½ oz) fresh apricots weighed without stones (1 CR). Cut apricots in half. Line steaming basin with these, inside part of apricot against basin, pour in sponge mixture, cover with greaseproof paper, steam 1 hr. 790 grm. (28 oz.).

137.—Sponge Pudding, Jam. 180 grm. (6¼ oz) self-raising flour, 48 grm. (1¾ oz) butter, 46 grm. (1¾ oz) sugar, 1 egg, pinch of salt, 5 oz milk, 109 grm. (3¾ oz)

Hartley's apricot jam (3½ CR), 1 teaspoonful lemon juice with apricot jam. Use a little of weighed butter for bowl, put jam in bottom of bowl, sieve flour, add sugar, rub in butter, beat egg, add to flour, lastly milk, pour mixture on top of jam and steam 1 hr. 585 grm. (20½ oz).

138.—**Sponge Pudding, Lemon, steamed.** 180 grm. (6¾ oz) self-raising flour, 48 grm. (1¾ oz.) butter, 67 grm. (2¾ oz) sugar, 1 egg, pinch of salt, 5 oz. milk, grated rind of two lemons. Grease pudding bowl with a little of the weighed butter, sieve flour, add sugar, rub in butter, beat egg, add egg, milk and grated lemon, pour mixture into prepared bowl, cover with greaseproof paper, steam 1 hr. 502 grm. (17¾ oz.).

139.—**Sponge Pudding, Rhubarb, baked.** Sponge recipe the same as R. 135, using 227 grm. (8 oz.) prepared rhubarb and 20 grm. (¾ oz.) sugar, ¼ oz. of water instead of apple. Grease pie dish with 2 grm (1/16 oz.) of the weighed butter, prepare rhubarb and lay in the bottom of the dish, add water and sugar, prepare sponge mixture in the usual way, pour over fruit and bake for 1 hr. 680 grm. (24 oz).

140.—**Suet Dumplings.** *67 grm. (2¾ oz.) flour, 22 grm. (¾ oz.) shredded suet (Atora), 4 grm. (⅛ oz.) Royal baking powder, 1½ oz. milk, salt, 10 grm (⅜ oz) flour extra for coating outside of dumplings Sieve flour, baking powder and salt, add suet, mix in milk with knife. Divide into four portions, flour hands, using the extra flour, and coat each portion with flour, form into balls, add to* stew and allow to simmer 15 min before serving.

141.—**Suet Pudding.** *49 grm. (1¾ oz.) flour, 22 grm. (¾ oz) shredded suet (Atora),* 4 grm. Royal baking powder, 1½ oz. milk, pinch salt. Sieve flour, baking powder and salt, add suet, mix in milk with knife *Use as a cap for fruit* dumplings, or steam separately for 1 hr. or bake 30 min. 125 grm. (4½ oz.).

142.—**Syrup Suet Pudding.** Use same amounts as in raisin pudding (*R. 131*); but 112 grm. (4⅛ oz.) golden syrup (4½ CR) instead of raisins Lift lid from syrup tin and set on stove to warm. Warm steaming bowl and lightly grease with 1 grm. butter, weigh steaming bowl, add 112 grm weights to scales, and pour syrup into bowl until amount is registered. Prepare suet pudding as in R. 141 and lift on to syrup, cover with kitchen paper and steam 2 hr. 627 grm. (22 oz.).

143.—**Yorkshire Pudding.** Use batter mixture, R. 101. Prepare and allow to stand, use 9 grm. (⅓ oz.) dripping instead of butter for baking tin Melt dripping in baking tin, allow to become piping hot, pour in batter after final beating and allow to cook in hot oven 40 min 255 grm. (9 oz.).

144.—**Apple Trifle.** 342 grm. (12 oz) prepared cooking apple, 10 grm. (⅜ oz) sugar, 62 grm. (2⅛ oz.) sponge cake (R. 187), 234 grm. (8¼ oz by weight), custard (R. 46). Stew apple with the sugar and 4 oz. water, beat with a fork, pour into dish, cut sponge cake into fingers and press on top of apple, pour custard over, grate nutmeg on top. 703 grm (25 oz.).

145.—**Chocolate Blancmange.** 64 grm (2¼ oz) Cadbury's breakfast chocolate, 39 grm. (1⅜ oz.) cornflour, 5 grm. (⅛ oz) sugar, 6 grm. (¼ oz.) butter, 1 pint milk, vanilla. Mix cornflour with a little milk, put remainder of milk into a rinsed pan, with the chocolate, butter and sugar, bring to boiling point, stir cornflour in until mixture is smooth. Cook gently for 5 min., add vanilla, pour into wetted mould or glasses. 635 grm. (22⅜ oz.).

146.—**Cornflour Blancmange.** 39 grm. (1⅜ oz.) cornflour, 16 grm. (½ oz) castor sugar, 1 pint milk, flavouring. Mix cornflour with a little milk, put remainder of the milk into a rinsed pan, bring to the boil, stir in cornflour vigorously to prevent lumps, add sugar, cook gently for 5 min. Add a little flavouring essence, pour into a wetted mould. 595 grm (21 oz).

147.—**Fruit Blancmange.** ½ CR red fruit, 39 grm. (1⅜ oz.) cornflour, 16 grm. (½ oz) sugar. Stew the fruit in water, add one or two saccharine tablets, strain and press fruit through strainer, make juice up to one pint with water, mix cornflour with a little juice, put remainder on to boil, add cornflour and sugar, stir vigorously; cook gently for 5 min. 553 grm (19½ oz.).

148.—**Caramel Custard.** *Caramel.* 63 grm. (2¼ oz) sugar, 1 tablespoon water, 1 tablespoon lemon juice. *Custard.* R. 113. Put water, lemon juice and sugar in a saucepan, heat gently until dissolved, then boil until coffee coloured; completely coat the inside of a hot bowl with the caramel. Heat milk, pour on to beaten egg and sugar, stir, pour into the caramel coated bowl, cover, stand on rack in steaming pan so that bowl containing custard does not come in contact

with the boiling water, steam very gently 1 hr., allow to become quite cold, turn out. 402 grm. (14½ oz.).

149.—**Cream Shape.** 9 oz. (by volume) cream, 32 grm. (1¼ oz.) sugar, 7 grm. (¼ oz.) gelatine, flavouring, 2½ oz. water. Dissolve gelatine in the warm water, half whip cream, add sugar, gelatine and flavouring, stir occasionally until cream starts to set, pour into a wetted mould, chill. 332 grm. (11¾ oz.).

150.—**Cream of Rice.** 63 grm. (2¼ oz.) Carolina rice, 1 pint milk, 42 grm. (1½ oz.) sugar, 3 oz. cream, grated lemon rind, or any flavouring. Wash rice, put it into a rinsed pan with the milk, allow to stand, cook very slowly until rice has absorbed the milk, add sugar and flavouring, allow to cool, add stiffly whipped cream. 539 grm. (19 oz.).

151.—**Custard Cream.** Ingredients of custard R. 113, 7½ oz. (by volume) cream, 7 grm. (¼ oz.) gelatine, 3 oz. water, flavouring. Dissolve gelatine in the water and warm gently, make custard, put milk into double saucepan to get hot, beat egg and sugar together, pour hot milk over egg, return to double saucepan and cook over hot water until custard thickens, cool, stir occasionally as custard cools, add dissolved gelatine and flavouring, and half-whipped cream, stir from time to time until cream starts to set, pour into a wetted mould 590 grm. (21 oz.).

152.—**Fruit Cream, Raspberry.** ½ pint cream, 7 grm. (¼ oz.) gelatine, 3 oz. water, 32 grm. (1¼ oz.) sugar, 198 grm. (7 oz.) fresh raspberries. Press raspberries through a sieve. Dissolve gelatine in the water, warming gently, whip cream, add sugar, gelatine, and fruit pulp, mix thoroughly, stir occasionally until mixture starts to set, pour into a wetted mould, chill, or put into a cold place until set. 526 grm. (18¾ oz.).

153.—**Honeycomb Cream.** 1 pint milk, 2 eggs, 7 grm. (¼ oz.) leaf gelatine, 31 grm. (1¼ oz.) sugar, vanilla. Soak gelatine in the milk for 10 min. to soften. Put milk, gelatine, egg yolks, and sugar into a rinsed saucepan, and bring to the boil, stir meantime. Whip whites to a snow, add vanilla, and whites, mix thoroughly and pour into a wetted mould or crystal. 635 grm. (22½ oz.).

154.—**Tapioca Cream.** 57 grm. (2 oz.) flake tapioca, 1 pint milk, 2 eggs, 21 grm. (¾ oz.) sugar, flavouring. Soak tapioca in the milk for an hour, bring slowly to the boil, while doing so stir in the yolks beaten with the sugar, cook gently for 5 min., remove from stove, stir in flavouring and stiffly-whipped whites. 595 grm. (21 oz.).

155.—**Lemon Jelly.** 84 grm. (3 oz.) sugar, 15 grm. (½ oz.) leaf gelatine, 8 oz. water, 4 oz. lemon juice. Soften gelatine in 4 oz. water. Dissolve sugar in the remaining 4 oz. water, add gelatine to sugar and heat until thoroughly dissolved, cool, add lemon juice, strain into a wetted mould, allow to set in a cool place. 440 grm. (15½ oz.). If a very clear jelly is required put the ingredients along with the white and crushed shell of 1 egg into a small pan, bring to boiling point, cool slightly, strain through jelly bag. Lemon jelly makes a good basis for fruit moulds.

156.—**Lemon Snow.** Allow jelly (R. 155) to become almost set, whip until very light and frothy.

157.—**Orange Jelly.** 74 grm. (2½ oz.) sugar, 15 grm. (½ oz.) leaf gelatine, 4 oz. orange juice (¼ CR), 3½ oz. water, 2 oz. lemon juice. Soften gelatine in the water, dissolve sugar in the fruit juices, add gelatine and stir until thoroughly dissolved, strain into a wetted mould, allow to set in a cool place. 354 grm. (12½ oz.).

158.—**Orange Snow.** Allow orange jelly to set partially in a bowl, whip until light and frothy, set in wetted mould or in wetted individual glasses.

159.—**Meringues.** 105 grm. (3¾ oz.) sugar, whites of 2 eggs, little vanilla and lemon juice, 125 grm. of cream. Prepare two baking trays, warm and grease with 2 grm. butter, dust with 4 grm. flour. Whip whites very stiffly, add vanilla and lemon juice, fold sugar into whites, best done with a metal spoon, lift 10 large teaspoonfuls of mixture on to each prepared tray, dry off in a very slow oven for 1½ hr., remove from oven, push centres in, return for another 30 min. to dry thoroughly. 20 half cases 122 grm. (4¼ oz.). Whip cream, add flavouring (lemon essence or vanilla) and divide equally among meringues. Each meringue with 2 half cases 37 grm. (1¼ oz.).

160.—**Prune Mould.** 272 grm. (9¾ oz.) prunes, 10 oz. water, 15 grm. (½ oz.) leaf gelatine, 3 or 4 saccharine tablets, juice of ½ lemon. Wash and soak prunes in the water, stew with the saccharine, remove stones, cut prunes up finely, soak

and dissolve gelatine in the juice, add lemon juice and sufficient water to make liquid up to 10 oz. Stir in prunes, pour into wetted mould. 570 grm. (20 oz.).

161.—**Strawberry Custard.** 179 grm. (6¼ oz.) strawberries, 52 grm. (1⅞ oz.) castor sugar, 2 eggs, a little lemon juice. Mash strawberries in a bowl with the sugar, separate the eggs, add yolks to strawberries, stand in a pan of boiling water, stir mixture until it thickens, lift from pan, add whites whipped stiffly, mix lightly but thoroughly, serve very cold. 350 grm. (12¼ oz.).

162.—**Summer Pudding.** 57 grm. (2 oz.) bread; ½ CR of loganberries (raspberries or red currants) stewed with water to make 1 pint, add one or two saccharine tablets, slice bread, cutting a round for the bottom of bowl, cut three cornered pieces for the sides, and dovetail them loosely round the bowl, pour in the hot stewed fruit, use the odd pieces of bread for top, press down cover with a saucer and allow to stand until following day. 665 grm. (23½ oz.).

163.—**Trifle.** 34 grm. (1¼ oz) sponge cake (⅛ R. 185) ½ CR strawberry or raspberry jam, 2 oz. sherry, 19 grm. (⅝ oz) ratafias (⅛ R. 175), 117 grm. (4⅛ oz.) custard sauce (¼ R. 46), 37 grm. (1¼ oz) cream. Split sponge cake and spread with jam, arrange in dish, grate about half the amount of ratafia biscuits, lay aside for top decoration; break remaining ratafias up, sprinkle over sponge cakes, soak with sherry, pour custard over, allow to stand, whip cream, add a little vanilla essence, arrange on trifle, sprinkle with grated ratafia. 258 grm. (9⅛ oz.).

164.—**Trifle without Cream.** The same as Trifle No. 1, but omit cream. 221 grm. (7¾ oz).

165.—**Chocolate Ice Cream.** 10 oz. milk, 44 grm. (1½ oz) sugar, 1 egg, 63 grm. (2¼ oz. by weight) cream, pinch salt, 26 grm. (⅞ oz.) Cadbury's breakfast chocolate. Cook the chocolate with the custard, allow to cool, add whipped cream. Freeze. 425 grm. (15 oz.).

166.—**Ice Cream using Jam.** 10 oz. milk, 44 grm. (1½ oz), sugar, 1 egg, pinch salt, 3 CR jam (99 grm. home-made strawberry jam R. 209), 63 grm. cream. Make custard the same as for Fruit Ice Cream Add whipped cream and sieved jam to cooled custard and enough cochineal to make the ice cream an attractive colour. Freeze. 459 grm. (16 oz).

167.—**Junket Ice Cream.** 10 oz. milk, 77 grm. (2¾ oz) sugar, 100 grm (3½ oz. by weight) cream, small teaspoonful rennet, vanilla, ratafia or almond, 440 grm. (15½ oz.) fresh or stewed raspberries (½ CR). Mix milk and cream, add sugar and heat until lukewarm, add flavourings and rennet, leave in warm place until set and cool, then freeze in a block, serve with raspberries as a border (raspberries may be stewed with 4 saccharine tablets). 466 grm. (16½ oz).

168.—**Raspberry Ice Cream.** 10 oz. milk, 79 grm. (2¾ oz) sugar, 88 grm (3⅛ oz. by weight) cream, 1 egg, pinch salt, 198 grm. (7 oz) fresh raspberries. Heat milk in double boiler, beat egg, sugar and salt, pour milk over egg, stir, return to pan and cook until custard thickens (about 5 min.), allow to cool. Press raspberries through a sieve, whip cream, add cream and raspberry pulp to custard. Freeze. 530 grm. (19⅛ oz.)

169.—**Strawberry Ice Cream.** 250 grm. (8⅞ oz. by weight) cream, 100 grm. (3½ oz.) sugar, 179 grm. (6¼ oz) strawberries (½ CR fruit). Crush strawberries, mix in sugar and allow to dissolve, whip and add cream. Freeze. 525 grm. (18½ oz.).

170.—**Vanilla Ice Cream.** 10 oz. milk, 1 egg, 66 grm. (2¼ oz.) sugar, pinch salt, 63 grm. (2¼ oz. by weight) cream, vanilla. Heat milk in double boiler, beat egg, sugar and salt together, pour boiling milk over, stir, return to pan and cook for 5 min. or until mixture thickens Allow to cool, whip cream and add to custard, add flavouring. Freeze. 350 grm. (12 oz.).

171.—**Vanilla Ice Cream.** (Rich) 10 oz. milk, 1 egg, 62 grm. (2¼ oz.) sugar, pinch salt, 163 grm. (5¾ oz. by weight) cream, vanilla or any other flavouring. Follow method for ice cream R. 170. 492 grm. (17 oz).

172.—*Note on Cake-Making.* Grease cake tins or paper for lining tins with butter from recipe allowance. Use cake cases whenever possible, they do not require to be greased, so that the whole of the weighed butter may be used as an ingredient of the cake. Sponge cake and cakes are best made in greased tins.

173.—**Dessert Biscuits.** 136 grm. (4¾ oz) flour, 52 grm. (1⅞ oz.) butter, 93 grm. (3¼ oz) sugar, 1 egg yolk, pinch salt, lemon rind and juice or other flavouring may be used. Weigh butter and reserve a little—2 grm. (1/16 oz.)—to grease

lightly two baking trays, sieve flour and reserve small spoonful for use on baking board, rub butter into flour, add dry ingredients and mix, finally add egg yolk and lemon juice, work into a lump with the hand, roll out on board, cut into 20 biscuits (309 grm.—11 oz). Bake in a slow oven for 30 min. 262 grm. (9¼ oz).

174.—Ginger Snaps. 82 grm. (2¾ oz) each of sugar, golden syrup and flour, 60 grm. (2¼ oz) butter, 10 grm. (¼ oz) ground ginger, pinch of salt. Reserve small piece of butter (3 grm.) to grease three slightly heated baking trays. Put butter, syrup and sugar into a saucepan, allow to melt. Sieve flour, salt and ginger into a bowl; make a well in centre and stir in syrup mixture, mix thoroughly, teaspoon mixture on to the prepared trays, leave plenty of room for snaps to spread, cook for 15 min in moderate oven Allow to cool slightly, roll each snap round handle of a wooden spoon, lay on cake tray to cool off and crisp. This amount makes 20 snaps. 277 grm. (9¾ oz.) Teaspoonful lemon juice and brandy may be added if liked.

175.—Ratafia Biscuits. 113 grm. (4 oz) each of ground almonds and castor sugar, whites of 2 eggs Mix ground almonds and sugar, whip whites stiffly, add almonds and sugar to whites, mix in as lightly as possible; If strong flavour is wanted add a few drops of almond essence. 283 grm. (10 oz) Heat baking tray, rub over with buttered paper, lay mixture in small half teaspoonfuls on tray, bake in moderate oven 20 or 30 min. 227 grm. (8 oz).

176.—Gingerbread Sponge. 140 grm (5 oz) flour, 113 grm (4 oz) syrup, 29 grm. (1 oz) butter, 28 grm (1 oz) sugar, and 45 grm. (1¾ oz) sultanas, 1 egg, 1 tablespoonful of milk, 4 grm (⅛ oz) each of ground ginger, allspice and bicarbonate of soda. Prepare shallow tin, line and grease paper with a little of the weighed butter Melt syrup and butter in a saucepan, sieve flour, ginger, allspice, add sugar and fruit, mix soda with the milk, add butter and syrup to flour, then soda and beaten egg, pour into prepared tin and bake for 30 min. Cut into 18 pieces 394 grm. (14 oz)

177.—Ginger Loaf, wholemeal. 283 grm. (10 oz) syrup, 100 grm. (3½ oz.) butter, 217 grm. (7¾ oz) sugar, 514 grm (18 oz.) wholemeal flour, 8 grm. (¼ oz) each of allspice, cinnamon and ginger, 5 grm (⅛ oz) bicarbonate soda, 4 grm. (¼ oz.) salt, 2 eggs, 3 oz. milk Grease shallow tin with a little of the weighed butter, melt syrup, butter and sugar in saucepan; sieve spice, salt and soda, mix thoroughly with the flour, pour in syrup mixture, then beaten eggs and milk; mix well, pour into prepared tin and bake in steady oven for 50 min. 1,205 grm. (2 lb. 10¼ oz).

178.—Oatcakes. 227 grm (8 oz) Midlothian medium oatmeal, 28 grm (1 oz) butter or bacon fat, or 23 grm. (¾ oz.) dripping, ¼ teaspoonful salt, ditto of baking soda, 2 to 3 oz hot water. Reserve a tablespoonful of oatmeal to use on baking board, mix the soda and salt with the remainder. Melt the fat, make a well in centre of oatmeal, add melted fat and hot water to make a soft mixture Turn out on to baking board, form into a ball, and roll out ⅛ inch thick Care must be taken to use up all oatmeal on board. It may be picked up with a knife and rubbed on the oatcakes. 312 grm. (11 oz). Cut out the cakes and bake for ½ hr in moderate oven. 241 grm. (8½ oz).

179.—Parkin. 439 grm (15½ oz) fine oatmeal, 66 grm. (2¼ oz) flour, 74 grm. (2¾ oz) sugar, 4 grm. (⅛ oz) soda, 8 grm (¼ oz) ground ginger, 110 grm. (3¾ oz) butter, 439 grm. (15½ oz) syrup, pinch salt. Prepare shallow tin, line with paper and grease with a little of the weighed butter, mix all dry ingredients, rub in butter, warm syrup and add, pour into prepared tin and cook for 1½ hr. in slow oven 1,070 grm (2 lb. 5¾ oz)

180.—Plum Cake (Mrs. Coltman's). 346 grm. (12 oz) flour, 290 grm (10¼ oz) sugar, 242 grm (8½ oz.) butter, 300 grm (10½ oz.) each of currants and raisins, 200 grm. (7 oz) mixed peel, 198 grm (7 oz) egg content, 30 grm. (1 oz) almonds, 1 grm cinnamon, pinch of salt Line cake tin with greased paper, using a little of the weighed butter for this purpose. Prepare fruit, sieve flour, cream butter and sugar, whisk eggs, mix ingredients thoroughly by hand. Bake 2½ hrs in moderate oven 1,830 grm (65 oz).

181.—Brown Rolls. 168 grm. (5¾ oz.) wholemeal flour, 40 grm. (1¾ oz) white flour, 1 heaped teaspoonful baking powder, ½ teaspoonful salt, 7 oz. milk. Reserve large spoonful flour for use on baking board, sieve flour, salt and baking powder, mix well together, make into a soft dough with the milk, reserve a little milk to brush over rolls, turn on to a well floured board, roll out, cut

into 16 pieces, form into balls by hand, lay on baking sheet, brush over with milk, bake in a hot oven for 20 min. 310 grm. (11 oz.).

182.—**Dinner Rolls.** 216 grm. (7¾ oz.) flour, 10 grm. (¼ oz.) lard or butter, 8 grm. (¼ *oz*) *yeast*, ½ *teaspoonful salt*, 5 *oz. warm water*. *Sieve flour and salt* (reserve good spoonful flour for use on baking board), rub in fat, cream yeast with the warm water, pour into centre of flour, mix a little, cover yeast with some flour, cover bowl and stand 20 min. in a warm place. Work in all the *flour with the hand*, knead and make a firm dough, cover bowl and stand again in the warm for an hour, or until the dough has doubled its bulk. Turn on to a floured board, knead lightly, shape into 8 rolls or twists, set these on a greased tin for 10 min. in a warm place, bake in a hot oven for 25 min. 213 grm (7½ oz.).

183.—**White Rolls.** *These are made in the same way as brown rolls, using in all* 202 grm. (7¼ oz.) of white flour. 310 grm. (11 oz.).

184.—**Shortbread.** 121 grm. (4¼ oz.) fresh butter, 113 grm. (4 oz.) salt butter, 100 grm. (3½ oz.) sugar, 332 grm (11¾ oz.) flour, 113 grm (4 oz.) rice flour. Reserve teaspoonful flour and 2 grm. butter for mould. Cream butter, sieve *flour and rice flour, mix with the sugar, add flour, etc. to butter, work all* together with the hand into a smooth dough, divide into four; oil a shortbread mould, and dust with flour, press cakes into mould, dust with flour each time, lay on lightly greased baking trays, prick centre, bake in moderate oven *for 1 hr. 4 shortbreads each weigh 174 grm. (6¼ oz.). If shortbread mould is* not available, roll shortbread out, cut into cakes, prick on top, and pinch round edges with forefinger and thumb and bake.

185.—**Sponge Cake.** 175 grm. (6¼ oz.) flour, 113 grm. (4 oz.) sugar, 66 grm. (2¼ oz.) butter, 2 eggs, 2½ oz. milk, 4 grm. (¼ oz.) baking soda, 8 grm. (¼ oz.) cream of tartar. *Warm cake tin, grease with a little of the butter (3 grm. ample).* Cream butter and sugar. Sieve flour, pinch salt, soda and cream of tartar, add flour and one egg, beat well, add more flour and second egg, lastly flavouring and milk. Bake 35 min. 475 grm (16¾ oz.).

186.—**Sponge Cake II.** Same quantities as R. 185 and method; but instead of soda and cream of tartar use 5 grm (level teaspoonful) Royal baking powder. Sieve baking powder with a little of the flour. Make this the final addition to cake mixture. 454 grm (16 oz.).

187.—**Sponge Cakes.** 61 grm (2¼ oz.) flour, 79 grm. (2¾ oz.) castor sugar, 3 eggs, 4 *grm.* (¼ *oz.*) *Royal baking powder (level teaspoonful), 6 grm.* (¼ *oz*) *butter*, pinch salt. Weigh and sieve flour, measure baking powder and mix with a little of the flour, weigh sugar, mix 1 teaspoon of flour and 1 of sugar for this Prepare 12 tins, warm and grease with 3 grm butter, coat with the flour and sugar. Warm large mixing bowl, cream remaining butter, add *eggs, pinch* salt and sugar, whisk over bowl of hot water until thick and light coloured, add flour, and lastly baking powder. Divide into the 12 prepared tins, cook in good oven for 15 min. 247 grm. (8¾ oz.)

188.—**Sultana Cake.** 227 grm. (8 oz.) flour, 336 grm. (11¾ oz.) sultanas, 139 grm. (5 oz) *sugar, 121 grm.* (4¼ *oz*) *butter*, 2½ *oz. milk, 2 eggs*, pinch of salt, 10 grm. Royal baking powder. Grease a cake tin with a little of the butter, cream butter and sugar, sieve flour, and salt, mix spoonful of flour with sultanas to prevent fruit sinking to bottom of cake, sieve another spoonful flour with the *baking powder, add flour and beaten egg* alternately to creamed butter and *sugar, beat well, add milk, fruit* and lastly *baking powder*, mix thoroughly and lift into prepared cake tin. Bake for 1¼ hr. 910 grm. (32 oz.).

189.—**Note on Fruit Bottling.** Use Kilner jars or any reliable make with screw tops, see that all rubber rings are in good condition. Wipe *fruit carefully* with clean cloth, place in jars to best advantage, put into cool oven and gradually increase heat, only a warm oven is required. Have boiling water ready, when the skins of the fruit show the first sign of cracking pour on the boiling water, fill jars with water, screw down tightly. This last operation must be done one bottle at a time and quickly. Time in oven varies so greatly according to size and fruit, no definite rule can be given, the fruit must be watched and the oven heat must be slow. It is best to use small bottles and the number of carbohydrate rations of fruit placed in each should be noted so that the required amount of fruit can be measured from the bottle without weighing before use. For instance if 1 lb. of Victoria plums is weighed into

a bottle then ¼ of the contents, which contains 4 oz of the fruit, will represent ¼ CR (see Table).

190.—**Note on Covering Home-made Jams.** To prevent mould from growing on the top of the jams they should be potted immediately after cooking; they may be covered with a well-fitting circular waxed paper, the wax downwards and then tied down tightly with a square of moistened parchment paper, and damp string; but a better plan is to use cellophane as follows: Warm jam jars, cover with cellophane jam pot covers according to directions given. This will give a germ proof covering through which contents can be inspected.

191.—**Apple Jam.** 908 grm. (2 lb.) sour apples, peeled, cored and chopped, ditto light brown sugar, ¼ pint water, 3 lemons, juice and grated rind, few pieces white ginger. Make a clear syrup of the sugar and water. Add apples, lemons and ginger. 2,130 grm. (4 lb. 11 oz.). Boil for 30 min. 1,530 grm. (3 lb. 6 oz.) Remove ginger before potting.

192.—**Apple Jelly.** 1,815 grm. (4 lb.) apples, wash, wipe, cut up roughly, remove stalks, but do not pare or core. Put apples in pan with 4 pints water, boil steadily for 1 hr. If apples become too stodgy add a little more water, press apples first through a coarse sieve to keep back all skin, pips and core. Then allow to drip through a jelly bag overnight; this should give about 3 pints of juice. The following day boil the 3 pints of apple juice, 1,360 grm. (3 lb.) sugar, 1½ oz. strained lemon juice, and 6 cloves, 3,350 grm. (7 lb. 5 oz.) for ¾ hr. stirring and skimming frequently. Pot in the usual way. 2,330 grm. (5 lb. 2 oz.)

193.—**Apple Pulp Jam.** Take pulp from jelly bag, 568 grm. (20 oz.), add 142 grm. (5 oz.) sugar, teaspoonful cinnamon, lemon or any flavouring. 738 grm. (26 oz.). Boil for 5 min. for immediate use in apple turnovers or boiled puddings. 710 grm. (25 oz.).

194.—**Apricot Jam.** 908 grm. (2 lb.) stoned apricots, ditto sugar. Stone fruit, then weigh, arrange alternate layers of fruit and sugar in basin, stand overnight, 1,790 grm. (3 lb. 15 oz.), break a few stones, and use as many blanched kernels as may be wanted. Put fruit, sugar and kernels in pan, bring to the boil, and boil steadily 15 min., stir occasionally, skim when jam is thoroughly boiling. 1,390 grm. (3 lb. 1 oz.).

95.—**Blackberry and Apple Jelly or Jam.** 1,360 grm. (3 lb.) blackberries, 680 grm. (1½ lb.) apples. Cover with 4 pints water and boil for 30 min. Allow 3 lb. juice, 3 lb. sugar. Boil briskly for 15 min. 2,330 grm. (5 lb. 2 oz.). (If for jelly allow juice to drip through jelly bag; if for jam, press juice and pulp through sieve or gravy strainer.)

196.—**Black Currant Jam.** 908 grm. (2 lb.) currants, ditto sugar, 1¼ pints of water (18 oz. water to each pound of fruit). Boil fruit in water until quite tender, 1,590 grm. (3 lb. 8 oz.), add sugar, boil again until it sets which takes about ¼ hr. 2,070 grm. (4 lb. 9 oz.)

197.—**Black Currant Jelly.** 908 grm. (2 lb.) black currants, ditto sugar, 20 oz. water. Boil water and sugar candy high, which usually takes about 20 min. Add currants and allow to boil well up for 2 min. 1,930 grm. (4 lb. 4 oz.). Have everything in readiness for straining and potting jelly. To prevent waste have all utensils piping hot. Empty contents of pan into colander set in a basin, from basin pour through gravy strainer, set in mouth of a jug, pour into jars. 1,475 grm. (3 lb. 4 oz.)

198.—**Black Currant Pulp Jam.** Quite good jam may be made of the currant pulp of the last recipe. After straining the jelly off, return the currant skins and any pulp to preserving pan, 454 grm. (1 lb.), add 908 grm. (2 lb.) sugar and 1 pint water and boil for 30 min. 1,700 grm. (3 lb. 12 oz.) Use at once as jam or in winter for roly-polys or any cooking purpose.

199.—**Damson Jam.** 908 grm. (2 lb.) damsons, ditto sugar, ¼ pint water. Dissolve sugar in the water, slit damsons and add to sugar, 2,070 grm. (4 lb. 9 oz.), boil for ¾ hr., skim thoroughly while boiling. Remove stones as they rise to the top. 1,560 grm. (3 lb. 7 oz.) This method is employed when making all large fruits.

Follow directions for Damson jam in the two following jams:

200.—**Cherry Plum Jam.** After boiling 30 min. 1,560 grm. (3 lb. 7 oz.)

201.—**Victoria Plum Jam.** After boiling 30 min. 1,588 grm. (3 lb. 8 oz.)

202.—**Lemon Curd.** 205 grm. (7¼ oz.) castor sugar, 100 grm. (3½ oz.) butter, 2 lemons, rind and juice, 3 eggs. Boil sugar, butter and lemons until liquid, add eggs

well beaten and whisk gently over low flame until mixture thickens in 7 min. 475 grm. (16¾ oz.).

203.—**Marmalade I.** 454 grm. (1 lb) Seville or sweet oranges, juice of 1 lemon, 1,590 grm. (3½ lb) sugar, 3 pints water. Halve oranges and take out pips, cut oranges by machine or hand, or put them through mincer, allow them to soak overnight in a basin with the water. 2,020 grm. (4 lb. 7 oz). Tie pips and any hard pieces of orange in muslin and boil with the oranges for ½ hr. Pour back into basin and let stand till cold, remove muslin with pulp. 1,530 grm. (3 lb. 6 oz.). Add sugar and lemon juice and boil 30 min. 2,640 grm. (5 lb 13 oz.).

204.—**Marmalade II.** As above, but omit ½ lb. sugar and lemon juice. Final weight 2,380 grm. (5 lb. 4 oz.).

205.—**Raspberry Jam.** 908 grm. (2 lb.) raspberries (or loganberries), ditto sugar. Put raspberries and sugar in preserving pan, heat slowly, stir gently not to break fruit. Boil for 20 min. 1,475 grm. (3 lb. 4 oz.). Test after 15 min. if jam seems to be thickening.

206.—**Red Currant Jelly.** Amounts are the same, and the same method is employed as for Black Currant Jelly (R. 197). More jelly is obtained. 1,700 grm. (3 lb. 12 oz).

207.—**Red Gooseberry Jam.** 908 grm. (2 lb.) gooseberries, ditto sugar, 10 oz. water. Put all into preserving pan, heat slowly, boil for 30 min. 1,620 grm. (3 lb. 9 oz.). If jam is inclined to thicken, test after 20 min. boiling.

208.—**Rhubarb Jam.** 1,364 grm. (3 lb.) rhubarb, ditto sugar. Prepare and cut rhubarb, then weigh, put rhubarb and sugar in a large basin and stand for 24 hr. Pour off liquid sugar and juice. 1,900 grm. (4 lb. 3 oz). Boil briskly for 30 min., add rhubarb and boil for another 30 min. 1,960 grm. (4 lb. 5 oz.). If flavouring is wanted allow ½ teaspoonful of ground ginger and grated rind of ½ lemon to each pound of rhubarb and sugar

209.—**Strawberry Jam I.** 908 grm. (2 lb.) strawberries, ditto sugar, 4 oz. red currant juice. Put fruit juice and sugar in preserving pan, stir until sugar is dissolved, add strawberries, boil for 30 min., skim thoroughly while boiling, cool slightly before putting in jam pots 1,480 grm. (3 lb. 4 oz)

210.—**Strawberry Jam II.** 908 grm. (2 lb.) strawberries, 1 lemon, 908 grm. (2 lb.) apples for extract, 1,135 grm. (2½ lb) sugar. Wash the apples and remove the stalks, slice them without peeling or coring, cover with 2 pints water, boil for ½ hr. Strain, use 1 pint of apple liquid, return to jam pan, add strawberries and lemon juice, boil for 20 min., add sugar, boil for 15 min. 1,930 grm. (4 lb. 6 oz.).

211.—**Strawberry Jam III.** 908 grm. (2 lb) strawberries, 1,364 grm. (3 lb.) sugar, 5 oz. Certo. Put the fruit into a pan and bring to the boil, add the sugar and boil for 6 min. Turn the gas out and add the pectin, stir for 10 min. and skim, leave to cool for 15 min. 2,190 grm. (4 lb. 13 oz). Pot and tie down immediately.

SPECIMEN DIETS

CALORIES 2,200-1,200. MIXED DIETS.

(For explanation of these diets and alternatives, see p. 11.)

DIET A.

2,200 Calories. Ratio C. to F.=2 to 1 Formula: 10½ CR, 10½ FR, 88 grm. P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
	Milk ½ pint	—	7	½	½	7
1 CR, ½ FR	Vegetables, Class 1 and 2, Table 3, as required, including half small grapefruit ..	—	—	½	—	5
BREAKFAST:						
	White Bread	114	4	3	—	10·5
3 CR	or White Bread	76	2½			
	+ Oxford Marmalade ..	35	1½			
	or White Bread	76	2½			
	Oatmeal	30	1			
	Tomato or half small grapefruit					
½ CR, 3 FR	Bacon, collar or gammon, fried	30	1	—	1	6
	or 1 Egg Cream	12	½			
	1 Egg			—	½	6
	or Fish portion, Table 5					
	Butter	18	½	—	1½	
	Fruit, Table 3		—	½		
Alternatives	Bacon as above	30	1			
½ CR, 3 FR	Sausages, ½ R. 73b	58	2			
	Butter	12	½			
½ CR, 3 FR	White Fish fried, Table 7 ..	84	3			
	Bread	10	½			
	Butter	24	½			
LUNCH:						
	Rump Steak, fried	40	1½	—	1	10
½ CR, 1 FR	Vegetables, Class 1 and 2 ..					
	Fruit, Table 3			½		
1 CR, 2 FR	Mashed Potato, ½ R. 76 ..	120	4½	1	½	2·5
	Cream	37	1½	—	1½	1·5
Alternative	Potato Chips, ½ R. 74 ..	42	1½			
1 CR, 2 FR	Cream	12	½			
TEA:						
	Bread	38	1½	1	—	3·5
1 CR, 1 FR	Sardines	22	½	—	½	4·5
	Butter	6	½	—	½	
	Lettuce					
DINNER:						
	Mutton Chop, grilled	43	1½	—	1	13·5
1½ CR, 1½ FR	or Duck, roast	43	1½			
	or White Fish boiled, Table 5	73	2½			
	Butter	10	½			
	Vegetables, Class 1 and 2					
	Potatoes boiled	113	4	1	—	1·5
	Bread	19	½	½	—	2
	Butter	6	½	—	½	

DIET A—*continued*

2,200 Calories. Ratio C. to F. = 2 to 1. Formula: 10½ CR, 10½ FR, 88 grm. P.

		Grm.	Oz.	CR.	FR.	P.
Alternatives	Chicken roast	68	2½			
1½ CR, 1½ FR	Vegetables, Class 1 and 2					
	Bread Sauce II, ½ R. 26 ..	82	3			
	Potatoes mashed, ½ R. 76 ..	120	4½			
	or Potatoes boiled ..	113	4			
	Butter	6	¼			
1½ CR, 1½ FR	White Fish fried, Table 7 ..	84	3			
	White Bread	10	½			
	Vegetables, Class 1 and 2					
	Mashed Potatoes, ½ R. 76 ..	120	4½			
2 CR, 1½ FR	+ Custard Pudding, R. 112 ..	295	10½	1½	1	10
	Cream	—	½	—	½	0·5
	Fruit, Table 3			½		
Alternatives (a)	Suet Pudding, ½ R. 141 ..	63	2½			
2 CR, 1½ FR	Sugar	10	⅜			
	or Golden Syrup	12	½			
	or Jam, Table 1	15	½			
	1½ Water Biscuits	12	½			
	Cheddar Cheese	15	½			
2 CR, 1½ FR (b)	*Cheese Straws, ½ R. 60* ..	25	⅞			
	Cream	12	½			
	Golden Syrup, ½ Tart R. 97	35	1¼			
	Fruit, Table 3					
2 CR, 1½ FR (c)	4 Digestive Biscuits H. & P.	62	2½			
2 CR, 1½ FR (d)	2 Pancakes, ½ R. 129 ..	126	4½			
	Lemon					
	Cream	12	½			
	Sugar	10	⅜			
2 CR, 1½ FR (e)	+ Bread and Butter Pudding, ½ R. 105	193	6¾			
	Cream	12	½			
	Fruit, Table 3					
2 CR, 1½ FR (f)	+ Custard Blancmange, ½ R. 111	124	4½			
	Fruit, Table 3					
	3½ Cornish Wafer H. & P. ..	34	1½			
	or + 2½ Shortbread Greenock P.F.	34	1½			
2 CR, 1½ FR (g)	Baked Milk Pudding, ½ R. 125	152	5½			
	Cheddar Cheese	15	½			
	2½ Water Biscuits H. & P.	24	⅞			
	Butter	6	¼			
2 CR, 1½ FR (h)	3½ Cream Crackers H. & P.	28	1			
	Butter	6	¼			
	or Cheddar Cheese ..	15	½			
	Fruit, Table 3					
	+ Sugar	10	⅜			
2 CR, 1½ FR (i)	Fruit Dumpling, ½ R. 116 ..	242	8½			
	Brown Bread	24	⅞			
	Cheddar Cheese	15	½			
2 CR, 1½ FR (j)	Batter Pudding, ½ R. 101 ..	113	4			
	or Yorkshire Pudding, ½ R. 143	127	4½			
	Fruit, Table 3					
	Cream	12	½			

DIET B.

1,800 Calories. Ratio C. to F.=2 to 1. Formula

		Gr
THROUGH THE DAY:		
	Milk ½ pint	—
1 CR, ½ FR	Vegetables, Class 1 and 2, including half small grapefruit ..	—
BREAKFAST:		
2 CR, 1½ FR	Alternatives, Diet C. Breakfast	
1 CR, 1 FR	White Bread	3
	or White Bread	1
	Cooper's Oxford Marmalade	1
	or Oatmeal	3
	Butter	1
	or 1 Egg	
	Butter	
	or Cream	2
LUNCH:		
1 CR, 2 FR	as in Diet C, Dinner	
TEA:		
½ CR, 1 FR	as in Diet C, Tea	
DINNER:		
	Roast Leg of Mutton	4
1 CR, 1 FR	or Roast Sirloin of Beef ..	4
	Butter	
	Vegetables, Class 1 and 2 ..	
	Bread	3
2 CR, 1½ FR	+Apple Charlotte, ½ R. 100 ..	12
	Butter	
	Cheddar Cheese	1
	3½ Thin Captain Biscuits ..	2
Alternatives		
2 CR, 1½ FR	Diet A, Dinner	

DIET C.

1,400 Calories. Ratio C to F.=2 to 1. Formula: 6½ CR, 6½ FR, 64 P.

		Grm.	Oz	CR.	FR.	P.
THROUGH THE DAY:						
	Milk ½ pint	—	7	½	½	7
1 CR, ½ FR	Vegetables, Class 1 and 2, including half small grapefruit ..	—	—	½	—	5
BREAKFAST:						
2 CR, 1½ FR	White bread	76	2½	2	—	7
	or White bread . ..	57	2			
	Fruit, Table 3					
	Bacon, collar or gammon, fried	30	1	—	1	8
	or Bacon as above	15	½			
	1 Egg					
	or 2 Eggs					
	or Bloaters, grilled ..	58	2			
	Butter	6	½	—	½	—
	Tomato					
Alternatives	White bread	57	2			
2 CR, 1½ FR	White fish, fried, bread, Table 7	84	3			
	or Sausages, ½ R. 73B ..	58	2			
	or 2 Fish cakes, ½ R. 17 .	87	3			
	or Fish Pudding, ½ R. 21	109	3½			
	Butter	6	½			

ERRATA

p 86
ISO-CALORIC EQUIVALENTS: *for* 1 CR, *read* ½ CR

p 103 DIET C.
TEA: *for* 1 CR, *read* ½ CR,

DIET D.
DINNER: *add* Fruit, ½ CR

p 111 DIET N
THROUGH THE DAY: *for* ½ CR, *read* ½ CR,
DINNER: Take half the amount of Golden Syrup to make up 3½ CR, *for* meal

p 113 DIET R.
DINNER: *add* Bread, 19 grm. ½ oz. ½ CR

p 114 DIET S.
LUNCH: *for* ½ CR, *read* 1 CR,

DIET T
LUNCH: *for* 2 CR, *read* 2½ CR,
after Mashed Potatoes, *insert* ½ FR

DIET C—*continued*

1,400 Calories. Ratio C. to F.=2 to 1. Formula: 6½ CR, 6½ FR, 64 P.

		Grm.	Oz.	CR.	FR.	P.
DINNER:						
1 CR, 2 FR	Salt silverside, boiled	61	2½	—	1	17
	Potatoes, boiled, old	113	4	1	—	1·5
	Butter	12	½	—	1	—
	Vegetables, Class 1 and 2					
	Half small grapefruit					
TEA:						
1 CR, 1 FR	Bread	19	½	½	—	1·5
	Sardines	22	½	—	½	4·5
	or 1 Egg					
	Butter	6	½	—	½	—
	Lettuce					
SUPPER:						
2 CR, 1½ FR	Cheddar Cheese	30	1	—	1	9
	Vegetables, Class 1 and 2	6	½	—	½	—
	Butter	57	2	1½	—	5
	Bread					
	Fruit, Table 3					
Alternatives						
2 CR, 1½ FR	Diet A, Dinner					

DIET D.

2,000 Calories. Ratio C. to F.=3 to 1 approx. Formula 11½ CR, 7½ FR, 67 P

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
	Milk ½ pint	—	7	½	½	7
1 CR, ½ FR	Vegetables, Class 1 and 2, including half small grapefruit ..	—	—	½	—	5
BREAKFAST:						
2 CR, 1½ FR	Alternatives, Diet C, Breakfast ..			2	1½	15
2½ CR, 1 FR	Oatmeal	30	1	1	—	5
	Butter	4	½	—	½	—
	Bread	38	1½	1		3·5
	Oxford Marmalade	17	½	½	—	—
	or Fruit, Table 3					
	Cream	12	½	—	½	0·5
LUNCH:						
	Silverside, boiled	61	2½	—	1	17
1 CR, 2 FR	Beef Fat	10	½	—	1	—
	Bread	38	1½	1	—	3·5
	Vegetables, Class 1 and 2					
	Half small grapefruit					
TEA:						
	Lettuce, Tomato					
½ CR	1½ Water biscuits	12	½	½	—	1
DINNER:						
	Chicken roast	68	2½	—	½	20
2½ CR, 1 FR	Vegetables, Class 1 and 2					
	Potatoes, boiled, old	170	6	1½	—	2
	Bread Sauce, ½ R. 26	82	3	½	½	3
	Bread	19	½	½	—	2
2 CR, 1½ FR	Suet Pudding, ½ R. 141 ..	63	2½	1	1	3
	Sugar	10	½	½	—	—
	or Golden Syrup	12	½			
	or Jam, Table 2	15	½			
Alternatives						
2 CR, 1½ FR	Diet A, Dinner					

DIET B.

1,800 Calories. Ratio C. to F.=2 to 1. Formula: G

THROUGH THE DAY:		
	Milk ½ pint	½
1 CR, ½ FR	Vegetables, Class 1 and 2, including half small grapefruit ..	½
BREAKFAST:		
2 CR, 1½ FR	Alternatives, Diet C. Breakfast	
1 CR, 1 FR	White Bread	1
	or White Bread	1
	Cooper's Oxford Marmalade	1
	or Oatmeal	½
	Butter	1
	or 1 Egg	½
	Butter	½
	or Cream	½
LUNCH:		
1 CR, 2 FR	as in Diet C, Dinner	
TEA:		
½ CR, 1 FR	as in Diet C, Tea	
Dinner:		
	Roast Leg of Mutton	4
1 CR, 1 FR	or Roast Sirloin of Beef ..	4
	Butter	½
	Vegetables, Class 1 and 2 ..	½
	Bread	1
2 CR, 1½ FR	+Apple Charlotte, ½ R. 100 ..	15
	Butter	½
	Cheddar Cheese	½
	3½ Thin Captain Biscuits ..	½
Alternatives		
2 CR, 1½ FR	Diet A, Dinner	

DIET C.

1,400 Calories. Ratio C. to F.=2 to 1. Formula: 6½ CR, 6½ FR, 6½ P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
	Milk ½ pint	—	7	½	½	7
1 CR, ½ FR	Vegetables, Class 1 and 2, including half small grapefruit .	—	—	½	—	5
BREAKFAST:						
2 CR, 1½ FR	White bread	76	2½	2	—	7
	or White bread . .	57	2			
	Fruit, Table 3					
	Bacon, collar or gammon, fried	30	1	—	1	8
	or Bacon as above . ..	15	½			
	1 Egg					
	or 2 Eggs					
	or Bloaters, grilled .	59	2			
	Butter	6	¼	—	¼	—
	Tomato					
Alternatives	White bread	57	2			
2 CR, 1½ FR	White fish, fried, bread, Table 7	84	3			
	or Sausages ½ R. 73B .	58	2			
	or 2 Fish cakes, ½ R 17 .	87	3			
	or Fish Pudding, ½ R 21	109	3½			
	Butter	6	¼			

ERRATA

p. 66
ISO-CALORIC EQUIVALENTS: *for* 1 CR, *read* ½ CR

p. 103 DIET C.
TEA: *for* 1 CR, *read* ½ CR,

DIET D
DINNER: *all* Fruit, ½ CR

p. 111 DIET N.
THROUGH THE DAY: *for* ½ CR, *read* ½ CR.
DINNER: Take half the amount of Golden Syrup to make up 3½ CR, for meal

p. 113 DIET R.
DINNER: *all* Bread, 19 grm. ½ oz. ½ CR

p. 114 DIET S
LUNCH: *for* ½ CR, *read* 1 CR,

DIET T.
LUNCH: *for* 2 CR, *read* 3½ CR,
after Mashed Potatoes, *insert* ½ FR

DIET C—*continued*

1,400 Calories. Ratio C. to F.=2 to 1. Formula: 6½ CR, 6½ FR, 64 P.

		Grm.	Oz.	CR.	FR.	P.
DINNER:						
1 CR, 2 FR	Salt silverside, boiled	61	2½	—	1	17
	Potatoes, boiled, old	113	4	1	—	1·5
	Butter	12	½	—	1	—
	Vegetables, Class 1 and 2					
	Half small grapefruit					
TEA:						
1 CR, 1 FR	Bread	19	½	½	—	1·5
	Sardines	22	½	—	½	4·5
	or 1 Egg	6	½	—	½	—
	Butter					
	Lettuce					
SUPPER:						
2 CR, 1½ FR	Cheddar Cheese	30	1	—	1	9
	Vegetables, Class 1 and 2	6	½	—	½	—
	Butter	57	2	1½	—	5
	Bread					
	Fruit, Table 3					

Alternatives
2 CR, 1½ FR Diet A, Dinner

DIET D.

2,000 Calories. Ratio C. to F.=3 to 1 approx. Formula 11½ CR, 7½ FR, 87 P

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
1 CR, ½ FR	Milk ½ pint	—	7	½	½	7
	Vegetables, Class 1 and 2, including half small grapefruit ..	—	—	½	—	5
BREAKFAST:						
2 CR, 1½ FR	Alternatives, Diet C, Breakfast ..	30	1	2	1½	15
2½ CR, 1 FR	Oatmeal	4	½	1	—	5
	Butter	38	1½	—	½	—
	Bread	17	½	1	—	3·5
	Orford Marmalade or Fruit, Table 3	12	½	—	½	0·5
	Cream					
LUNCH:						
1 CR, 2 FR	Silverside, boiled	61	2½	—	1	17
	Beef Fat	10	½	—	1	—
	Bread	38	1½	1	—	3·5
	Vegetables, Class 1 and 2					
	Half small grapefruit					
TEA:						
½ CR	Lettuce, Tomato	12	½	½	—	1
	1½ Water biscuits					
DINNER:						
2½ CR, 1 FR	Chicken roast	68	2½	—	½	20
	Vegetables, Class 1 and 2	170	6	1½	—	2
	Potatoes, boiled, old	82	3	½	½	3
	Bread Sauce, ½ R. 26	19	½	½	—	2
	Bread	63	2½	1	1	3
2 CR, 1½ FR	Suet Pudding, ½ R. 141 ..	10	½	½	—	—
	Sugar	12	½			
	or Golden Syrup	15	½			
	or Jam, Table 2					

Alternatives
2 CR, 1½ FR Diet A, Dinner

DIET E.

1,600 Calories. Ratio C. to F.=3 to 1. Formula: 9 CR, 6 FR, 74 P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
1 CR, ½ FR	Milk ½ pint	—	7	½	½	7
	Vegetables, Class 1 and 2 including half small grapefruit	—	—	½	—	5
BREAKFAST:						
2 CR, 1½ FR	Alternatives, Diet C, Breakfast			2	1½	15
1 CR, ½ FR	Porce	26	½	1	—	3
	Cream	12	½	—	½	0·5
DINNER:						
	Hare, roast	71	2½	—	½	22
1 CR, 1 FR	Vegetables, Class 1 and 2					
	Butter	6	½	—	½	—
	Bread	38	1½	1	—	3·5
	Half small grapefruit					
TEA:						
1 CR, ½ FR	+Plum Cake, ⅛ R. 180 ..	37	1½	1	½	1·5
	or Bread	38	1½			
	Butter	6	¼			
SUPPER:						
1 CR, ½ FR	2½ Water biscuits	24	½	1	—	2
	Cheddar Cheese	15	½	—	½	4
	or Butter	6	¼			
2 CR, 1½ FR	Alternatives, Diet A, Dinner ..	—	—	2	1½	10·5

DIET F.

1,200 Calories. Ratio C to F = 3 to 1 approx. Formula: 6½ CR, 4½ FR, 61 P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
	Milk ½ pint	—	7	½	½	7
1 CR, ½ FR	Vegetables, Class 1 and 2 including half small grapefruit	—	—	½	—	5
BREAKFAST:						
2 CR, 1½ FR	Alternatives, Diet C, Breakfast			2	1½	15
DINNER:						
	Chicken, roast	68	2½	—	½	20
1 CR, 1 FR	Vegetables, Class 1 and 2					
	Bread Sauce, ½ R. 26	82	3	½	½	3
	Potatoes, boiled, old	57	2	½	—	1
	Half small grapefruit					
TEA:						
	Lettuce, Tomato					
½ CR	1½ Water Biscuits			½	—	1
SUPPER:						
2 CR, 1½ FR	Alternatives, Diet A, Dinner ..			2	1½	10·5

DIET G.

2,000 Calories. Ratio C. to F.=4 to 1. Formula: 13 CR, 6½ FR, 80 P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
	Milk ½ pint	—	7	½	½	7
1 CR, ½ FR	Vegetables, Class 1 and 2 including half small grapefruit	—	—	½	—	5

DIET G—*continued*

2,000 Calories. Ratio C. to F.=4 to 1. Formula: 13 CR, 6½ FR, 80 P.

		Grm.	Oz.	CR.	FR.	P.
BREAKFAST:						
	Force	26	1	1	—	3
	Cream	12	½	—	½	0·5
2½ CR, ½ FR	Bread	57	2	1½	—	5
	Half small grapefruit			2	1½	15
2 CR, 1½ FR	Alternatives, Diet C, Breakfast					
LUNCH:						
2 CR, 1½ FR	Mutton Chops, grilled	43	1½	—	1	13·5
	Vegetables, Class 1 and 2					
	Potatoes, mashed, ½ R. 76	120	4½	1	½	2
	Bread	19	½	½	—	2
	Fruit, Table 3			½		
TEA:						
1 CR, ½ FR	Alternatives, Diet E, Tea			1	½	1·5
DINNER:						
	Chicken, boiled	49	1½	—	½	13
	Potatoes	170	6	1½	—	2
2½ CR, ½ FR	Bread	38	1½	1	—	3·5
				2	1½	10·5
2 CR, 1½ FR	Alternatives, Diet A, Dinner					

DIET H.

1,200 Calories. Ratio C. to F.=4 to 1. Formula: 7 CR, 3½ FR, 73 P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
1 CR, ½ FR	Milk ½ pint	—	7	½	½	7
	Vegetables, Class 1 and 2 including half small grapefruit	—	—	½	—	5
BREAKFAST:						
	Oatmeal	30	1	1	—	5
	Fruit, Table 3			½		
2½ CR, ½ FR	Bread	38	1½	1		3·5
	1 Egg	—	—	—	½	6
DINNER:						
	Chicken, roast	68	2½	—	½	20
1 CR, 2 FR	Vegetables, Class 1 and 2	82	3	½	½	3
	Bread Sauce, ½ R. 26	19	½	½	—	2
	Bread	6	½	—	½	—
	Butter	15	½	—	½	3·5
	Cheddar Cheese					
TEA:						
	Bread	19	½	½	—	2
½ CR	Lettuce, Tomato					
SUPPER:						
	White fish steamed with	73	2½	—	½	15
	Butter; Table 5	4				
2 CR, ½ FR	Potatoes	57	2	½	—	1
	Bread	38	1½	1	—	3·5
	Fruit			½		

DIET I.

For a cardiac patient.

1,600 Calories. Ratio C. to F.=4 to 1. Formula 11 CR, 5½ FR, 45 P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
	Milk ½ pint	—	7	½	½	7
1 CR, ½ FR	Vegetables, Class 1 and 2 including half small grapefruit	—	—	½	—	5
BREAKFAST:						
2½ CR, 1½ FR	+Dextri-maltose	21	¾	1	—	—
	Half small grapefruit					
	Bread	57	2	1½	—	5
	1 Egg	—	—	—	½	6
	Butter	12	½	—	1	—
LUNCH:						
2½ CR, 1½ FR	+Sugar	21	¾	1	—	—
	Orange Juice	115	4	½	—	—
	2½ Water Biscuits	24	¾	1	—	2
	Vegetables, Class 1 and 2					
	Sardines	44	1½	—	1	9
	Butter	6	¼	—	¼	—
TEA:						
1½ CR, ½ FR	+Glucose	22	—	1	—	—
	Lemon Juice					
	1½ Water Biscuits	12	¾	½	—	1
	Butter	6	—	—	½	—
DINNER:						
1 CR	+Dextri-maltose	21	¾	1	—	—
1½ CR, 1½ FR	Alternatives, Diet A, Dinner ..			1½	1½	10·5
10 P.M.:						
	+Sugar	21	¾	1	—	—
1 CR	Lemon Juice					

HIGH PROTEIN DIETS

DIET J.

2,000 Calories. Ratio C. to F.=2 to 1. Formula: 6½ CR, 6½ FR, 211 grm. P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
	Milk ½ pint	—	13	1	1½	13
1½ CR, 1½ FR	Vegetables, Class 1 and 2 including half small grapefruit	—	—	½	—	5
BREAKFAST:						
1½ CR, 1 FR	Bread	57	2	1½	—	5·5
	White fish, steamed	146	5½	—	1	30
	Butter	8	¼			
	Plasmon	18	½	—	—	15
LUNCH:						
	Chicken, roast	136	4½	—	1	40
1 CR, 1 FR	Potatoes	57	2	1	—	1
	Vegetables, Class 1 and 2					
	Bread	19	½	½	—	2
	Plasmon	18	½	—	—	15
TEA:						
	Bread	38	13	1	—	3·5
1 CR, 1 FR	Butter	6	¼	—	¼	—
	1 Egg			—	¼	6
	Plasmon	16	½	—	—	13

DIET J—*continued*

2,000 Calories. Ratio C. to F.=2 to 1. Formula: 6½ CB, 6½ FB, 211 grm. P.

		Grm.	Oz.	CB.	FB.	P.
DINNER:						
	Sirloin, roast	162	5½	—	2	44
1½ CB, 2 FB	Potatoes	57	2	½	—	1
	Bread	19	¾	½	—	2
	Fruit, Table 3			½		
	Plasmon	18	½	—	—	15

DIET K.

Low Fat, Low Salt Diet. Sometimes recommended for nephrosis.

1,600 Calories. Ratio C. to F.=5 to 1. Formula: 7½ CB, 3 FB, 173 P.

		Grm.	Oz.	CB.	FB.	P.
THROUGH THE DAY:						
	Milk ½ pint	—	7	½	½	7
1 CB, ½ FB	Vegetables, Class 1 and 2 including half small grapefruit	—	—	½	—	5
BREAKFAST:						
	White fish, steamed	73	2½	—	½	15
2 CB, ½ FB	Bread made without salt* ..	57	2	1½	—	5
	Oxford Marmalade	17	½	½	—	—
	Plasmon	34	1½	—	—	28
LUNCH:						
	Chicken, boiled	98	3½	—	1	26
2 CB, 1 FB	Potatoes, boiled	113	4	1	—	1·5
	Vegetables, Class 1 and 2					
	Bread made without salt* ..	38	1½	1	—	3·5
	Plasmon	23	¾	—	—	19
	Half small grapefruit					
TEA:						
	Bread without salt	19	¾	½	—	2
½ CB	Plasmon	24	¾	—	—	20
DINNER:						
	Beef, topside, boiled	61	2½	—	½	19
2 CB, 1 FB	Potatoes	113	4	1	—	1·5
	Vegetables, Class 1 and 2					
	Bread made without salt* ..	19	¾	½	—	2
	Fruit, Table 3			½		
	Butter	6	¼	—	½	—
	Plasmon	23	¾	—	—	19

Owing to the high protein content this will be an acid diet (see page 63) and sodium and potassium bicarbonate should be given five times a day in amounts at least sufficient to make the urine alkaline, if the diet is to be used for nephrosis.

Heudebert's Biscuits, and Longuets without salt, Table 7, page 75, may be used when a low salt diet is required.

* See also page 57.

LOW PROTEIN DIETS

DIET L.

1,800 Calories. Ratio C. to F.=2 to 1. Formula: 9½ CB, 9½ FB, 34 grm. P.

		Grm.	Oz.	CB.	FB.	P.
THROUGH THE DAY:						
	Milk	—	3½	½	½	3·5
½ CB, ½ FB	Vegetables, Class 1 and 2 ..	—	—	½	—	5

DIET L—*continued*

lories. Ratio C. to F.=2 to 1. Formula: 9¼ CR, 9¼ FR, 34 grm. P.

		Grm.	Oz.	CR.	FR.	P.
r:						
	Force	20	¾	1	—	3
FR	Cream	25	1	—	1	1
	Bread	66	2¼	1¼	—	6
	Butter	27	1	—	2¼	—
	Mutton Cutlet, lean, fried ..	20	¾	—	1	3·5
FR	Vegetables, Class 1 and 2					
	Potatoes	113	4	1	—	1·5
	Bread	38	1¼	1	—	3·5
	Butter	6	¼	—	¼	—
	Fruit, Table 3			¼		
	Cream	25	1	—	1	1
	2¼ Water Biscuits	24	¾	1	—	2
t	Butter	12	½	—	1	—
	Rice, boiled	72	2½	1	—	2
FR	+Golden Syrup	25	2/3	1	—	—
	Vegetables, Class 1 and 2					
	Butter	18	½	—	1½	—
	Fruit			¼	—	—
	Cream	25	1	—	1	1

DIET M.

lories Ratio C. to F.=3 to 1. Formula: 7¼ CR, 5 FR, 29 grm. P.

		Grm.	Oz.	CR.	FR.	P.
IE DAY:						
	Milk ½ pint	—	7	½	½	7
	Vegetables, Class 1 and 2 including half small grapefruit	—	—	¼	—	5
	Bread	57	2	1½	—	5
	+Oxford Marmalade	17	½	½	—	—
	Butter	12	½	—	½	—
	Fruit, Table 3			¼		
	Cream	12	½	—	½	0·5
	Hors d'oeuvre, R.1			1	1	8
	1½ Water Biscuits	12	½	½		1
	Butter	6	¼		¼	
	+Lemon Sponge Pudding, ⅙ R. 138	50	1¾	1	¼	3
:	Cream	12	½	—	½	0·5
	Fruit			¼		
	Butter	6	¼	—	¼	—
	Bread	39	1¼	1	—	3·5
FR	Diet A, Dinner, a, b, f, h, white bread added ..	10	½			

DIET N.

High Carbohydrate Low Fat Diet.

1,800 Calories. Ratio C. to F.=5 to 1. Formula: 14 CR, 5½ FR, 34 grm. P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
	Milk	—	3½	½	½	3·5
½ CR, ½ FR	Vegetables, Class 1 and 2 ..	—	—	½	—	5
BREAKFAST:						
	+Orange Juice	115(c.c.)	¼	½	—	—
3½ CR, 1½ FR	Bread	65	2½	1½	—	6
	+Oxford Marmalade	17	½	½	—	—
	Butter	15	½	—	1½	—
	Fruit, Table 3			½		
DINNER:						
	Maitre d'Hotel Butter, 2 R 34 ..	18	½	—	1	—
4 CR, 1½ FR	Vegetables, Class 1 and 2					
	Potatoes, mashed, ½ R. 76 ..	120	4½	1	½	2
	Bread	19	½	½	—	2
	Rice, boiled	72	2½	1	—	2
	+Golden Syrup	25	½	1	—	—
	Fruit			½		
TEA:						
	Bread	57	2	1½	—	5
2½ CR, ½ FR	+Jam	30	1	1	—	—
	Butter	6	¼	—	½	—
SUPPER:						
	+Orange Juice	115(c.c.)	¼	½	—	—
	Rice, boiled	72	2½	1	—	2
2 CR, ½ FR	Vegetables, Class 1 and 2					
	Curry Sauce, ½ R. 32 ..	87	3	½	½	3
	or Brown Sauce, ½ R. 28 ..	115	4	1½	1	4
2 CR, 1½ FR	+Ice Cream with Jam, ½ R. 166 ..	12	½	½	½	0·5
	Cream					
	+Fruit					

Alternatives
2 CR, 1½ FR Diet A, Dinner, a, b, c, f, h

DIET O.

Low Purine Diet.

1,200 Calories. Ratio C. to F.=4 to 1. Formula: 8 CR, 4 FR, 42 P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
1 CR, ½ FR	Milk ½ pint	—	7	½	½	7
	Vegetables, Class 1 and 2 avoiding those with a high purine content (page 55)	—	—	½	—	5
BREAKFAST:						
	Bread	57	2	1½	—	5
2½ CR, 1 FR	1 Egg	6	¼	—	½	6
	Butter			½		—
	Fruit, Table 3	115(c.c.)	¼	½	—	—
	Orange Juice	10				
	or Sugar					

DIET O—*continued*

1,200 Calories. Ratio C. to F.=4 to 1. Formula: 8 CR, 4 FR, 42 P.

		Grm.	Oz.	CR.	FR.	P.
LUNCH:						
	4 Water Biscuits	36	1¼	1¼	—	3
2 CR, 1½ FR	Butter	12	½	—	1	—
	Cheddar Cheese	15	½	—	½	4
	Fruit, Table 3			½		
	Vegetables, Class 1 and 2					
TEA:						
	Tea to drink					
SUPPER:						
	Bread	57	2	1½	—	5
2½ CR, 1 FR	1 Egg			—	½	6
	or Caviare*	16	½			
	Butter	3	½			
	Butter	6	½	—	½	—
	or Cream	12	½			
	Fruit, Table 3 .. .			½		
	Vegetables, Class 1 and 2					
	Orange Juice	115(c.c.)	½	½	—	—
	or Sugar	10				

If the bread and biscuits are replaced by potatoes the alkalinity of the diet would be increased (page 63), but there would also be an increase of oxalates. Diets L, M, N, will be low purine diets, if vegetables with a high purine content are excluded and if in L the mutton cutlet is replaced by butter, 6 grm. and egg or cheese.

* Contains much salt.

LOW CALORIE DIETS

DIET P.

Mixed. *

800 Calories. Ratio C to F =4 to 1 Formula: 4 CR, 2 FR, 70 P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
	Milk	—	3	½	½*	3
½ CR, ½ FR	Vegetables, Class 1 and 2 including half small grapefruit	—	—	½	—	5
BREAKFAST.						
	Bread	47	1½	1½	—	4·5
1½ CR	White fish, steamed	73	2½	—		15
	Half small grapefruit					
LUNCH:						
	Chicken, boiled	49	1½	—	½	13
1 CR, ½ FR	Vegetables, Class 1 and 2					
	Potatoes	57	2	½	—	1
	Fruit, Table 3			½		
	Agar Jelly, page 76					
TEA:						
	Cup of tea, only					
SUPPER:						
	Sweetbread, stewed	55	2	—	½	12·5
1 CR, 1 FR	Bread	38	1½	1	—	3·5
	Dutch Cheese	28	1	—	½	10·5
	Vegetables, Class 1 and 2.					

* Allowing for the small amount of fat in the steamed fish at breakfast.

DIET Q.

Low Protein.

800 Calories. Ratio C. to F.=4 to 1. Formula: 5 CB, 2½ FB, 38 grm. P.

		Grm.	Oz.	CB.	FB.	P.
THROUGH THE DAY:						
½ CB, ½ FB	Milk	—	3	½	½	3
	Vegetables, Class 1 and 2, avoiding those with a high purine content (page 55)	—	—	½	—	5
BREAKFAST:						
1½ CB, 1½ FB	Bread	66	2½	1½	—	6
	1 Egg			—	½	6
	Half small grapefruit	15	½	—	½	—
	Butter					
DINNER:						
1 CB, ½ FB	Chicken, boiled	49	1½	—	½	13
	Vegetables, Class 1 and 2	57	2	½	—	1
	Potatoes, boiled			½		
	Fruit, Table 3					
TEA:						
	Cup of tea only					
SUPPER:						3·5
1½ CB, ½ FB	Bread	39	1½	1	—	—
	Butter	6	¼	—	½	
	Vegetables, Class 1 and 2	57	2	½	—	1
	Potatoes, boiled					

DIET R.

Low Fat.

800 Calories. Ratio C. to F.=6 to 1. Formula: 4½ CB, 1½ FB, 71 grm. P.

		Grm	Oz	CB.	FB.	P.
THROUGH THE DAY:						
½ CB, ½ FB	Milk	—	3	½	½*	3
	Vegetables, Class 1 and 2 including half small grapefruit	—	—	½	—	5
BREAKFAST:						
1½ CB	Bread	66	2½	1½	—	6
	White fish, steamed	73	2½	—	—	15
	Half small grapefruit					
DINNER:						
1 CB, ½ FB	Chicken, boiled	49	1½	—	½	13
	Vegetables, Class 1 and 2			½		
	Fruit, Table 3					
TEA:						
	Cup of tea only					
SUPPER:						20
1 CB, ½ FB	Beef, topside, boiled	61	2½	—	½	3·5
	Vegetables, Class 1 and 2	38	1½	1	—	
	White bread					

* Allowing for small amount of fat in the steamed fish.

DIET S.

For a cardiac patient.

800 Calories. Ratio C. to F.=5 to 1. Formula: 5 CR, 2 FR, 50 P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
	Milk ½ pint	—	7	½	½	7
1 CR, ½ FR	Vegetables, Class 1 and 2 including half small grapefruit	—	—	½	—	5
7 A.M.:						
	Sugar	10	½	½	—	—
½ CR	Half small grapefruit					
BREAKFAST:						
	Bread	19	½	½	—	2
½ CR, ½ FR	Egg	—	—	—	½	6
LUNCH:						
	Vegetables, Class 1 and 2					
½ CR, ½ FR	Potatoes, mashed, ½ R. 76 ..	120	4½	1	½	2·5
	White fish, steamed	73	2½	—	—	15
TEA:						
	Tea or Coffee					
½ CR	Sugar	10	½	½	—	—
SUPPER:						
	Chicken, boiled	49	1½	—	½	13
1 CR, ½ FR	Vegetables, Class 1 and 2					
	2½ Water Biscuits	24	½	1	—	2
10 P.M.:						
	Sugar	10	½	½	—	—
½ CR	Lemon					

LACTO-VEGETARIAN DIETS

DIET T.

1,600 Calories. Ratio C. to F =3 to 1. Formula: 9 CR, 6 FR, 74 grm. P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY.						
4 CR, 4 FR	Milk, 2 pints, as ordered below..	—	40	3	4	40
	Vegetables, Class 1 and 2, extra quantities	—		1	—	10
BREAKFAST:						
½ CR	Milk, ½ pint	—	10	—	—	—
	Fruit, Table 3	—	—	½		
LUNCH:						
2 CR, ½ FR	Milk, ½ pint	—	10	—	—	—
	Vegetables					
	Tomato Soup, ½ R. 15	—	10	—	—	—
	or Mashed Potatoes, ½ R. 76..	120	4½	1	—	6
	+ Lemon Jelly, ½ R. 165	110	4	1	—	4
	or Lemon Snow, ½ R 156	110	4	—	—	—
	Fruit	—	—	½		
TEA:						
	Tea					
	Milk, ½ pint					

DIET T—*continued*

1,600 Calories. Ratio C. to F.=3 to 1. Formula: 9 CR, 6 FR, 74 grm. P.

		Grm.	Oz.	CR.	FR.	P.
SUPPER:						
2 CR, 1½ FR	Milk, ½ pint	210	7½	1	1½	11
	Savoury Pudding, ½ R. 78	57	2	½	—	1
	Vegetables	—	—	½		
	Potatoes					
	Fruit					

DIET U.

800 Calories. Ratio C. to F.=3 to 1. Formula: 4½ CR, 3 FR, 37 grm. P.

		Grm.	Oz.	CR.	FR.	P.
THROUGH THE DAY:						
2 CR, 2 FR	Milk, 1 pint	—	20	1½	2	20
	Vegetables, Class 1 and 2	—	—	½	—	5
BREAKFAST:						
½ CR	Milk, ½ pint	—	5	—	—	—
	Fruit, Table 3	—	—	½		
LUNCH:						
1 CR, ½ FR	Milk, ¼ pint	—	5	—	—	—
	Tomato Soup, ½ R. 15	—	10	1	½	6
	Vegetables					
TEA:						
	Tea					
	Milk, ¼ pint	—	5	—	—	—
SUPPER:						
1 CR, ½ FR	Milk, ¼ pint	—	5	—	—	—
	Vegetables	—	10	1	½	6
	Artichoke Soup, ½ R. 6	120	4½	—	—	—
	or Mashed Potatoes ½ R. 76	57	1½	—	—	—
	or Potatoes	—	½	—	—	—
	Cream					
	Fruit, Table 3					

TABLE 9

BEVERAGES

ALCOHOL. The advantages and disadvantages of alcohol are much the same for the diabetic and non-diabetic. In ordinary circumstances it is of no advantage to the body to take it, but taken in moderate quantities it will probably not do any harm, though in diabetes even this has been denied. In the author's experience most diabetic patients are abstemious people. Before the days of insulin alcohol was used to supplement a deficient diet, but this reason does not hold at present.

The composition of some common beverages both as regards alcohol and sugar content are given below.

The amount of carbohydrate in a glass of dry wine may not amount to much, but the Calorie value should be allowed for, if it is taken regularly. The ordinary glass of wine, beer or cider contains much the same amount of alcohol, i e. between 10 or 20 c.cm.

WINES.

	Alcohol c.cm.	Cals.	Carbohydrate grm.
3½ oz. (100 c cm.) of	contain		
Champagne, dry	13	74	0·2
Claret, Australian	15	84	0
French	10	56	0
Italian	11	62	0
Spanish	14	82	1
Graves	12	69	0·4
Hock	10	56	0
Marsala	17	112	3·6
Moselle	10	56	0
Port	20	128	2·6
Sauterne, dry	13	73	0
sweet	12	73	1·4
2½ oz. (71 c cm.) of	contain		
Madeira	13	79	1·4
Port	14	90	1·5—4
Sherry, brown	16	93	0·7
dry	13	73	0

SPIRITS.

1 oz (28 c cm) of	contain		
Brandy 30 under proof	11·3	63	0
Gin 20 under proof	13	73	0
Rum Proof	16·2	85	0
Whisky 20 over proof	19·3	108	0

LIQUEURS AND CORDIALS.

⅔ oz (19 c cm) of	contain		
Absinthe	11	62	0
Angostura	10	60	1
Anisette de Bordeaux	8	70	6
Benedictine	10	81	6
Chartreuse	8	70	6
Crème de Menthe	9	71	5
Curacoa	10	77	5
Kümmel	6	58	6

TABLE 0—*continued.*

BEERS.			Alcohol c.cm.	Cals	Carbohydrate grm.
½ pint (10 oz.) (283 c.cm.) of		contain			
Bitter Ale, English Stock	Bottled	Fremlin ..	17	107	3
India Pale Ale	,,	Whitbread	12	83	3
Lager, Dark	,,	Barclay ..	14	152	18
,, Light	,,	.. ..	11	113	13
London Stout	,,	Whitbread	15	124	10
Mild Ale	Draught	,,	12	111	11
Bitter Ale	,,	,,	14	104	6
Burton Ale	,,	,,	14	122	11
CIDER.					
Cider, very dry (Schweppes)	Large Bottles 11 oz.		19	113	2
,, Dry	,,		17	116	5
,, Medium Sweet	,,		15	113	7
,, Pomola			26	196	13
,, West Country			13	134	10
Cyder (Gaymer)	10 oz.		22	200	12
,, Two Star			13	166	18
,, Diamond			22	149	—
,, Still, dry, Special Reserve		.. ..	13	139	10
,, West Country					
MINERAL WATERS.*					
Ginger Ale, Sweet.	Large Bottles, 11 oz. (Schweppes)		0	107	26
			0	66	16
Lemonade	Splits, 6½ oz.	,,	0	49	12
Tonic Water	Babies, 4½ oz.	,,	0	98	24
Ginger Beer, after maturing,	Bottle 16 oz	,,	0	82	20
Ginger Ale, dry,	Large Bottles, 11 oz.	,,			

* See also Table 8.

TABLE 10

Many patients have up to the present had their food weighed in ounces. Consequently Table 10 is included, which gives the more common foods calculated as grm. carbohydrate, protein, fat and as Calories per ounce of foodstuff, so that patients may be able to calculate what they are having; in any case this calculation is a necessary preliminary to a change over to the scheme of diets described in this book.

A list of SOME COMMON FOODS with analyses mostly calculated per ounce (avoirdupois) of food stuff.

1 oz. (28¼ grm) of the undermentioned or one article contains:

	Carbo-hydrate. grm.	Fat grm.	Protein grm.	Calories.
One eating apple, largish without skin (3¼ oz—4 to the lb)	10	0	0	49
Bacon rashers, back, fried, including fat	0	15	7	169
Biscuits, water (H. & P.)	24	0	2·3	107
Bread, white	15	0·5	2·6	77
,, brown (Hovis) .. .	11·5	0·6	3·0	65
Butter	0	24	0·3	225
"Certo" (W. W. Payne's analysis)	1	—	—	—
Cheese, Cheddar	0	9	8	116
Chicken, roast	0	2	8·4	53
Cream	0	12	1	120
Curry Powder (W W. Payne's analysis)	9·3	0	0	39
One hen's egg	0	5·5	7	80
One Yolk 20·7 grm. (¾ oz) ..	0	5·5	3·3	65
One White 29·3 grm (1 oz) ..	0	0	3·7	15
Egg Contents, boiled (1 oz) ..	0	3	3·7	43
One duck's egg, 85 grm. (3 oz.) ..	0	7·4	6·8	97
Fish (cod, haddock), steamed ..	0	0·2	6	26
Flour	20	0·3	4	100
One Grapefruit, small, 4¼ oz. (peel weighing 2¼ oz.)	3·1	0	0·5	15
Meat, rump steak, grilled	0	6	7	85
topside, boiled	0	2·3	9·5	60
Milk	1·5	1	1	20
Oatmeal	19	2	4·6	115
One orange, 5 oz. (peel weighing 1¼ oz.)	8·3	0	0	34
Potatoes, boiled	5	0	0·5	23

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